RADC-TR-90-289
Final Technical Report
November 1990

B-DOT PROBE MEASUREMENTS

University of Colorado

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave Blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	November 1990	Final Oct 89 - Dec 89

4. TITLE AND SUBTITLE
B-DOT PROBE MEASUREMENTS

5. FUNDING NUMBERS
C - F30602-88-D-0025
PE - 63737D
PR - 5797
TA - 01
WU - P5

6. AUTHOR(S)
John D. Norgard and Ronald M. Sega

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
University of Colorado
Colorado Springs CO 80933-7150

8. PERFORMING ORGANIZATION REPORT NUMBER
N/A

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Rome Air Development Center (RBCT)
Griffiss AFB NY 13441-5700

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
RADC-TR-90-289

11. SUPPLEMENTARY NOTES
Georgia Institute of Technology Subcontract to University of Colorado
RADC Project Engineer: Michael F. Seifert/RBCT/(315) 330-7642

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

The scattering of an incident electromagnetic (EM) plane wave from a single B-dot probe and the interaction and mutual coupling between two B-dot probes were evaluated using a non-invasive, non-perturbing infrared (IR) measurement technique.

14. SUBJECT TERMS
Electromagnetic (EM), Electromagnetic Interference (EMI), Infrared (IR), Mutual Coupling

15. NUMBER OF PAGES
144

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UL

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I. Introduction

A study of the measurement accuracy of selected B-Dot probes has been completed. In general, the interaction of a B-Dot probe with an incident electromagnetic (EM) wave has been studied. Specifically, the scattering of an incident EM plane wave from a single B-Dot probe and the mutual coupling and resulting electromagnetic interference (EMI) between two B-Dot probes in close proximity have been studied, in part.

II. The Infrared Measurement Technique

The investigation of the interaction of B-Dot probes with EM waves was undertaken with a new Infrared (IR) measurement technique [1-8] that was developed at the University of Colorado. With this IR method, the two-dimensional field pattern scattered by the B-Dot probes can be measured in a minimally perturbing way. The interference pattern between two B-Dot probes can also be measured without introducing another metallic probe in the measurement volume.

The IR technique is based on the Joule heating that

occurs in a lossy material as an EM wave passes through the material. The material is assumed to have a finite conductivity, an imaginary permittivity, and an imaginary permeability. The absorbed heat energy is converted into conducted and convected heat energy and into re-radiated electromagnetic energy. This electromagnetic energy is concentrated in the IR band, and can be detected as the energy radiated from a "blackbody" radiator.

The technique involves placing a thin lossy planar detector screen in the vicinity of the probe. The conductivity and the imaginary components of the permittivity and the permeability of the detector material cause the temperature of the detector material to rise above the local ambient temperature of the surrounding environment, by an amount that is proportional to the local electrical and/or magnetic field intensity at each point on the detector screen. This produces a two-dimensional map of the electric and/or magnetic field in the screen material.

The screen material is tailored to be sensitive to only one component of the field. Care is also exercised not to significantly perturb the existing field by the presence of a lossy material. The thickness of the screen material is

usually less than 80 microns; the conductivity of the screen material is usually less than 8 mhos per meter.

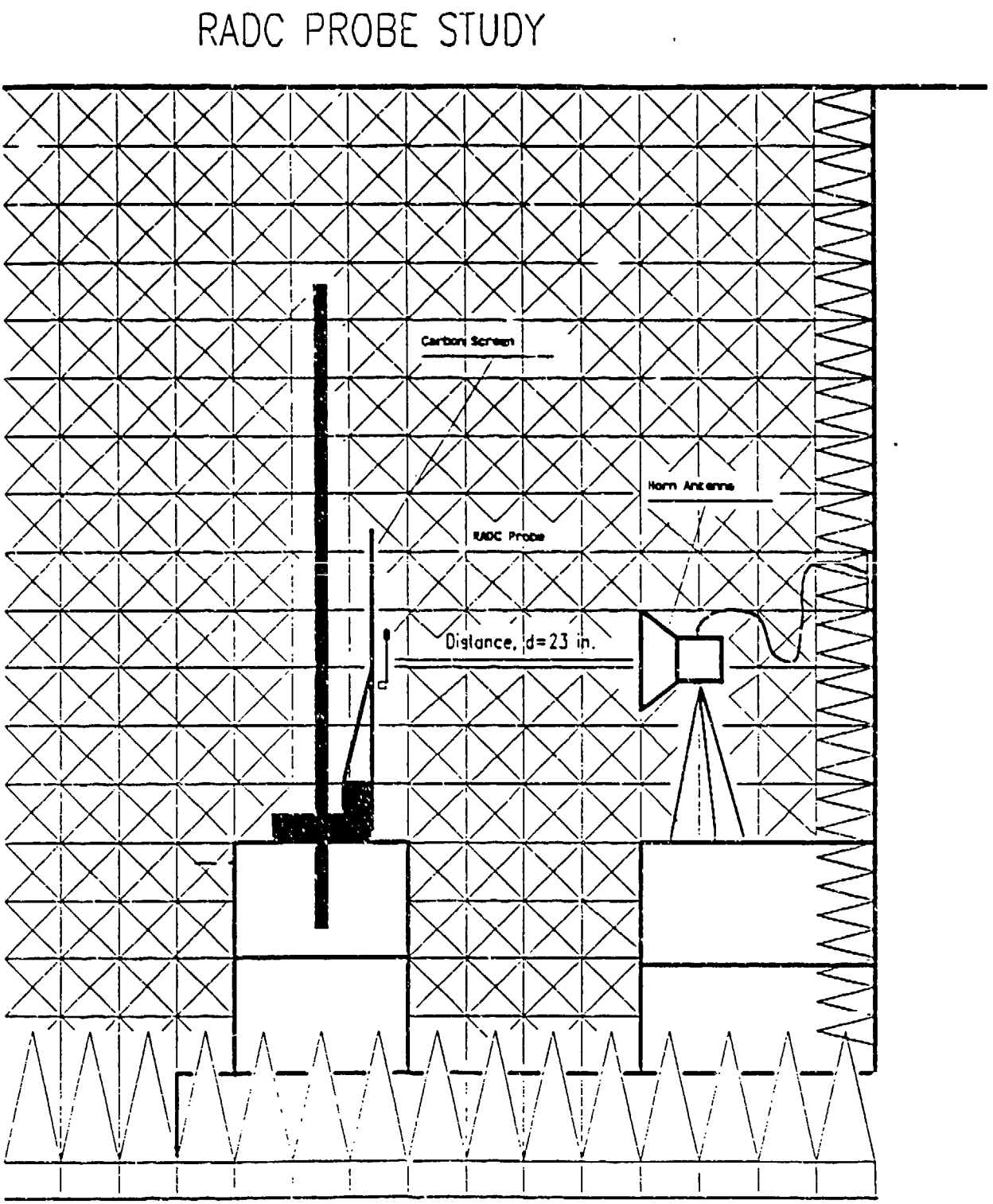
The temperature difference between the detector material and the background is detected, digitized, and stored in the memory of an AGA Thermo Vision system on a pixel by pixel basis. This stored data represents the temperature distribution over the extent of the detector screen and is a map of the intensity of the electric and/or magnetic field distribution absorbed in the screen. This data can be analyzed to determine the interaction of the probe with the incident EM field.

III. Test Setup

Two separate measurement configurations were studied. These measurements were made in the Anechoic Chamber in the Electromagnetics Laboratory (EML) at the University of Colorado.

The test setup for the various test configurations is shown in figure 1. The probe was suspended from a wooden support structure using thin non-conducting wire. The axis of the probe was aligned in a horizontal or vertical

FIGURE 1 - TEST SETUP



position. The incident EM plane wave was linearly polarized. For these tests, the incident wave was vertically polarized and the probe axis was also aligned in the vertical direction. The frequency was stepped from 1 to 18 GHz, in 0.5 GHz increments.

A. Ambient Free Space Reference Fields

Before each measurement was made on a B-Dot probe, the ambient background EM field intensity level was measured across the measurement area of interest, using the IR camera. This is a 1 meter by 1 meter planar surface area immediately adjacent to where the probe would be placed. The test setups for this reference level measurement are shown in Appendices A, B and C (cf. figures A1, B1, and C1, for the three different test configurations used).

In one setup, the camera was located 110 inches from the probe, at an angle of 45 degrees from the direction of propagation. In the second setup, the camera was 79.5 inches from the probe, at an angle of 20 degrees from the direction of propagation. In the third setup, the camera was 110 inches from the probe, at an angle of 45 degrees from the direction of propagation.

The measured ambient free space reference data are shown in Appendix A, B, and C. Figures A2 through A6 contain the 4 to 8 GHz data for the single probe reference field; figures B2 through B8 contain the 4 to 14 GHz data for the single probe reference field; and figures C2 through C6 contain the 8 to 14 GHz data for the two probe reference fields.

These fields are the free space fields that the B-Dot probe should measure. The data taken later with the B-Dot probe in place is compared to these background fields to determine the exact effect (perturbation) the probe has on the fields to be measured.

B. **B-DOT Interference Fields**

A number of measurements of the fields scattered by a single B-Dot probe in free space were made using the IR technique. This same technique was also used to measure the interaction between two B-Dot probes in free space.

Two different test setup configurations were used. In the first configuration, a single B-Dot probe was suspended

in free space and illuminated in the frequency range of 1 to 10 GHz. The scattered fields were determined with the IR technique, as a function of frequency. In the second configuration, two B-Dot probes, at various separations, were also illuminated from 1 to 10 GHz. The coupled fields (including the mutual interaction between the probes) were measured with the IR technique, as a function of separation distance and frequency.

1. **Single B-Dot Probe in Free-Space**

A number of measurements of the fields scattered by a single B-Dot probe in a free space environment were made using the IR technique. The test setups are shown in figures D1, E1, and F1 in Appendices D, E, and F.

a. **Scattered Fields**

The measured data are presented in Appendices D, E, and F. Appendix D contains the 1 to 4 GHz data for a single probe; Appendix E contains the 4 to 8 GHz data for a single probe; and Appendix F contains the 8 to 14 GHz data for a single probe.

Each figure in Appendix D, E, or F represents one IR measurement, at a single frequency, at one orientation of the B-Dot probe relative to the incident EM plane wave. The incident wave was vertically polarized in each case. For the measured data presented in this study, the axis of the B-Dot probe was also vertically oriented. The incident EM plane wave was normally incident on the probe.

As shown in figures D2 through D6, E2 through E6, and F2 through F8 in Appendices D, E, and F, the B-Dot probe interacts strongly with the incident EM wave.

Additional tests should be performed with a more sensitive detector screen to determine the exact nature of the coupling mechanisms and the absolute strengths of the interactions.

2. Two B-Dot Probes in Free Space

The interaction (mutual coupling) between two B-dot probes in a free space environment was also investigated. These tests are necessary to determine the mutual interaction between two or more probes placed close to each other. Such a situation would occur if several probes were

being used to simultaneously map a two or three dimensional region of space at the same time.

Two different types of tests were performed. In the first test, the probes were separated at three distinct distances, and the frequency varied from 1 to 8 GHz. In the second test, the probes were tested at three distinct frequencies, and the separation distance varied from 1 to 10 cm.

a. **Mutual Coupling & Interference Fields**

The measured data presented in Appendices G, H, and I are for 5.75", 4.75" and 2.75" separations between the probes, respectively. For all cases, the test setup is shown in figure G1. The data is for 1 through 8 GHz, in 1 GHz steps.

The measured data presented in Appendices J, K, and L are for 1, 5, and 10 GHz frequencies of the incident excitation, respectively. For each case, the test setup is shown in Figure J1. The data is for 1 through 10 cm separation distances, in 1 cm steps.

Figures J1, K1, and L1 show plan views of the two-probe configurations. Figures J2, K2, and L2 show camera views of the two-probe configurations. As show in those figures, the horn antenna, which illuminated the two probes at a frequency f, was approximately 2 feet from the probes. The frequency f was varied in the tests. The IR camera was positioned 7 feet from the probes. The camera angle, measured from the direction of the incident wave, was approximately 20 degrees.

B-Dot, series 300 probes were measured. The probes were aligned parallel to each other, and separated a distance D from each other. The distance D was also varied in the tests.

The polarization of the incident wave was vertical; the wave was normally incident on the probes.

Figure L3 shows the interference pattern generated for two B-Dot probes in free space, at 10 GHz, at a spacing of 10 cm, at one orientation, & at one polarization. As shown in that figure, each probe acts basically as a single dipole in free space. In figure L7, the probes are moved closer together (5 cm spacing). As shown in that figure, the probes

are beginning to interact with each other. A standing wave is beginning to form between the handles of the probes. In figure L11, the probes are moved very close to each other (1 cm spacing). Now, the probes interact with each other and the incident wave and significantly perturb the incident field. Strong interference & mutual coupling occurs between the probes at this spacing.

Other frequencies and configurations have been tested. A complete summary of all the test data is presented in the Appendices.

As shown in those figures, the probe interacts with the incident wave & significantly perturbs the incident field. Strong interference & mutual coupling occurs between the probes.

IV. **Conclusions**

As shown in the Appendices A through L, the B-Dot probe interacts with the incident wave and significantly perturbs the incident field. Additional measurements need to be performed to determine the magnitude of the perturbation and the consequences of the interaction on the measurement

accuracy of the B-Dot probe.

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APPENDIX A

Ambient Free Space

Single Probe Reference Fields

(4 to 8 GHz)

Figure A-1

RADC PROBE STUDY
FREE FIELD CONFIGURATION
DETAILED TOP VIEW OF SET UP

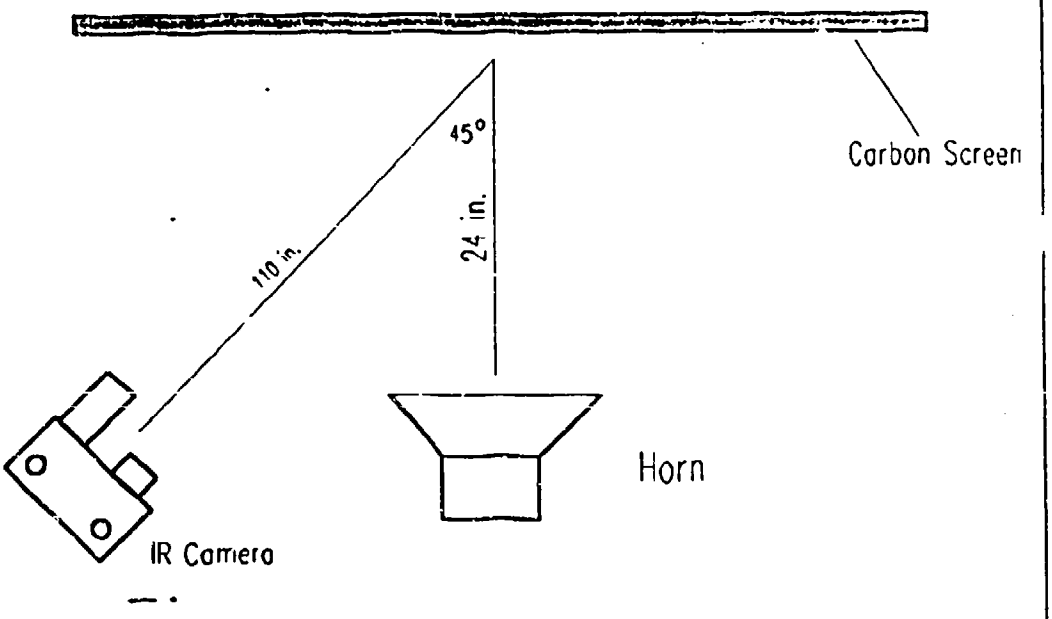


Figure A-2
Shot Number : 1000

Time of Recording : 1-10-1989 , 13:23

Frequency : 4 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

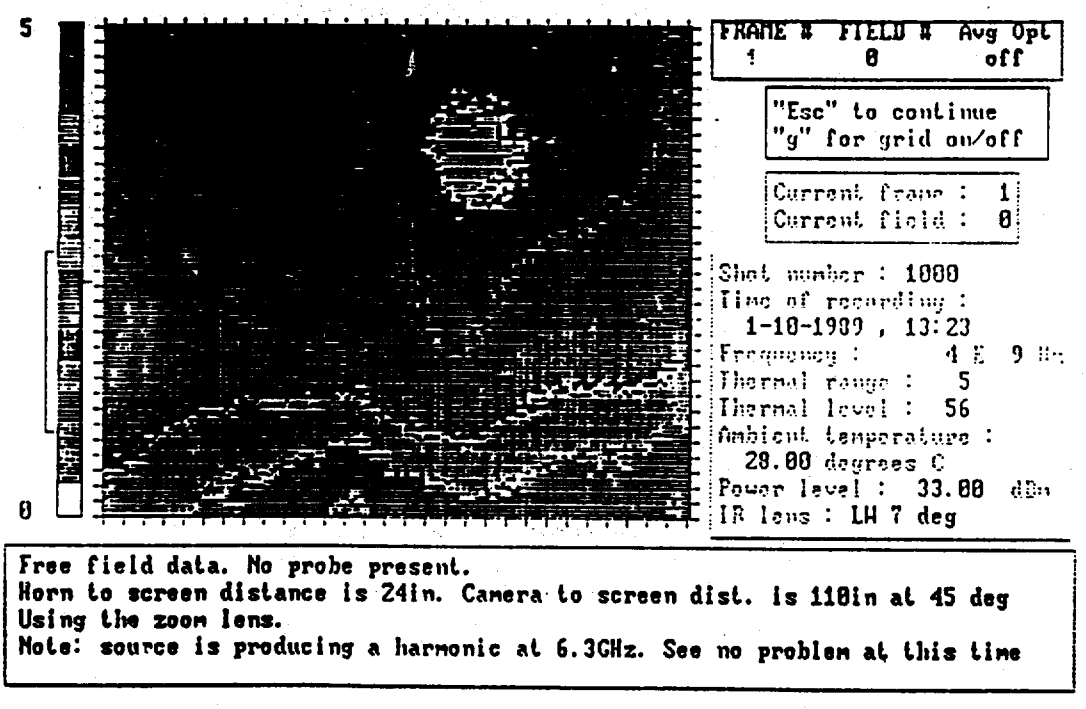
Power Level : 33 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr4gn.raw

Comments :

Free field data. No probe present.
Horn to screen distance is 24in. Camera to screen dist. is 110in at 45 deg
Using the zoom lens.
Note: source is producing a harmonic at 6.3GHz. See no problem at this time



Free field data. No probe present.
Horn to screen distance is 24in. Camera to screen dist. is 110in at 45 deg
Using the zoom lens.
Note: source is producing a harmonic at 6.3GHz. See no problem at this time

Figure A-3
Shot Number : 1001

Time of Recording : 1-10-1989 , 13:42

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

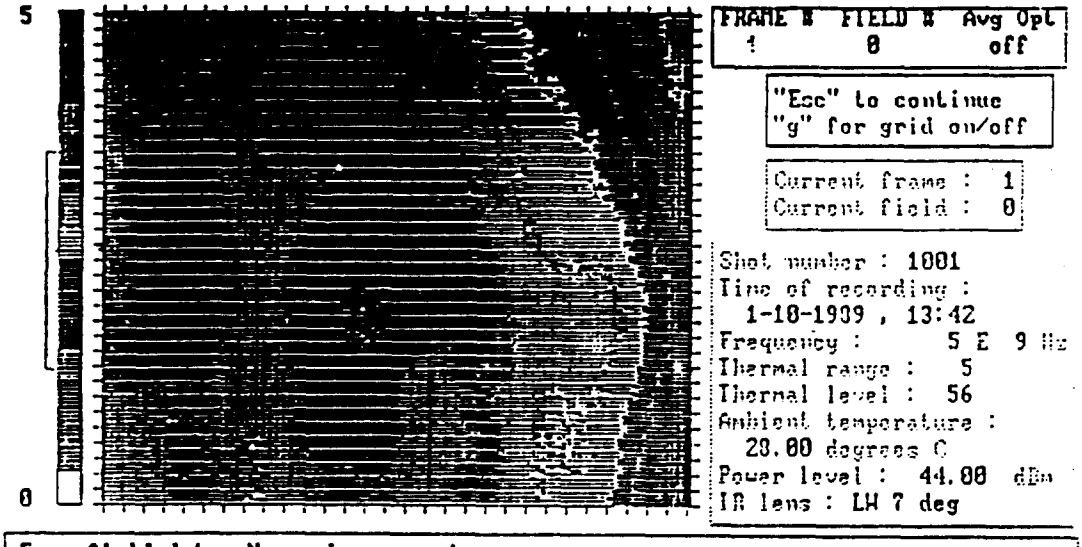
Power Level : 44 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : kr5gn.raw

Comments :

Free field data. No probe present.
Horn to screen distance is 24in. Camera to screen dist. is 110in at 45 deg
Using the zoom lens.
Note: source is producing a harmonic at 4.3GHz. See no problem at this time



Free field data. No probe present.
Horn to screen distance is 24in. Camera to screen dist. is 110in at 45 deg
Using the zoom lens.
Note: source is producing a harmonic at 4.3GHz. See no problem at this time

Figure A-4
Shot Number : 1002

Time of Recording : 1-10-1989 , 13:44

Frequency : 6 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

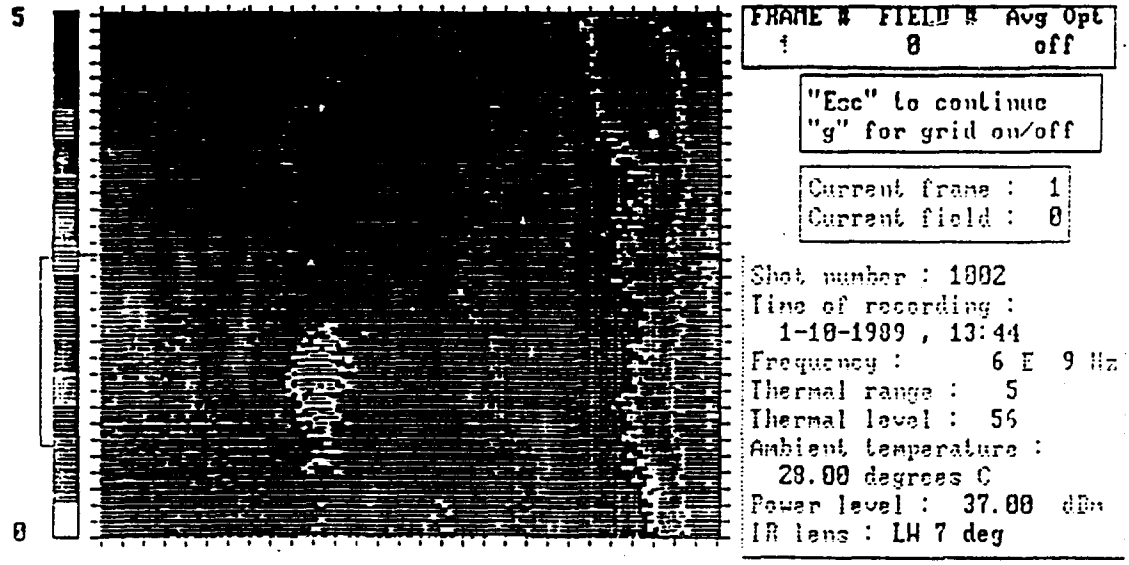
Power Level : 37 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : krg6gn.raw

Comments :

Free field data. No probe present.
Horn to screan distance is 24in. Camera to screen dist. is 110in at 45 deg
Using the zoom lens.
Nota: source is producing a harmonic at 5.3GHz. See no problem at this time



Free field data. No probe present.
Horn to screen distance is 24in. Camera to screen dist. is 110in at 45 deg
Using the zoom lens.
Note: source is producing a harmonic at 5.3GHz. See no problem at this time

Figure A-5
Shot Number : 1003

Time of Recording : 1-10-1989 , 13:52

Frequency : 7 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

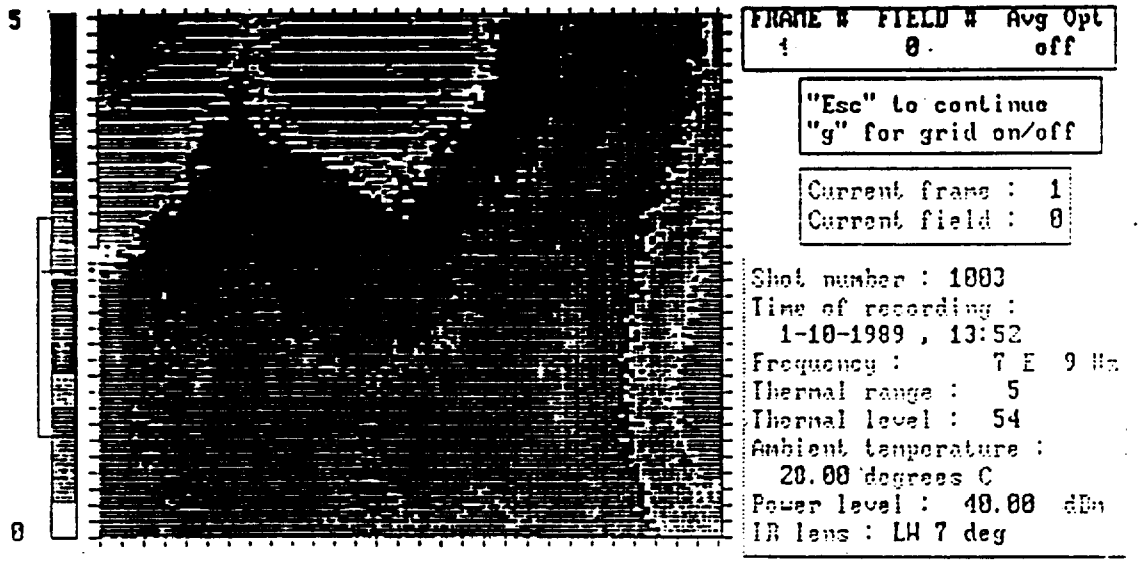
Power Level : 40 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr7gn.raw

Comments :

Free field data. No probe present.
Horn to screen distance is 24in. Camera to screen dist. is 110in at 45 deg
Using the zoom lens.
Note: source is producing a harmonic at 6.3GHz. See no problem at this time



Free field data. No probe present.
Horn to screen distance is 24in. Camera to screen dist. is 110in at 45 deg
Using the zoom lens.
Note: source is producing a harmonic at 6.3GHz. See no problem at this time

Figure A-6
Shot Number : 1004

Time of Recording : 1-10-1989 , 13:55

Frequency : 8 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

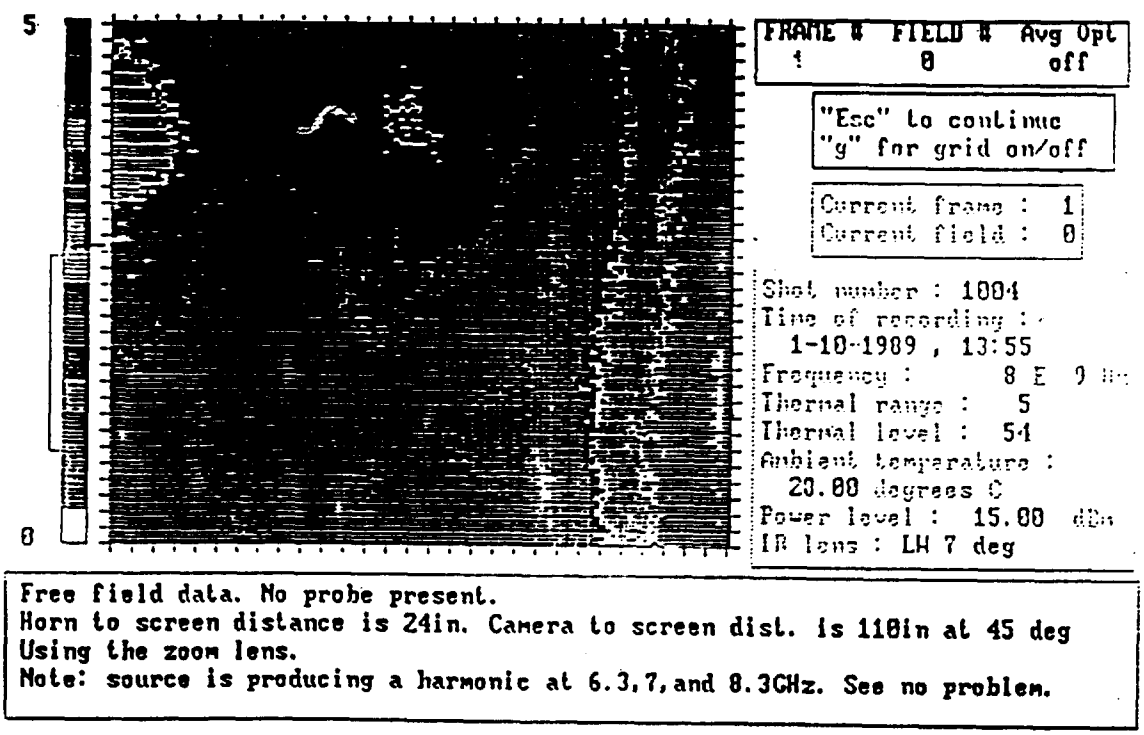
Power Level : 15 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr8gn.raw

Comments :

Free field data. No probe present.
Horn to screen distance is 24in. Camera to screen dist. is 110in at 45 deg
Using the zoom lens.
Note: source is producing a harmonic at 6.3,7,and 8.3GHz. See no problem.



APPENDIX B

Ambient Free Space

Single Probe Reference Fields

(8 to 18 GHz)

Figure B-1

RADC PROBE STUDY
FREE FIELD CONFIGURATION
DETAILED TOP VIEW OF SET UP

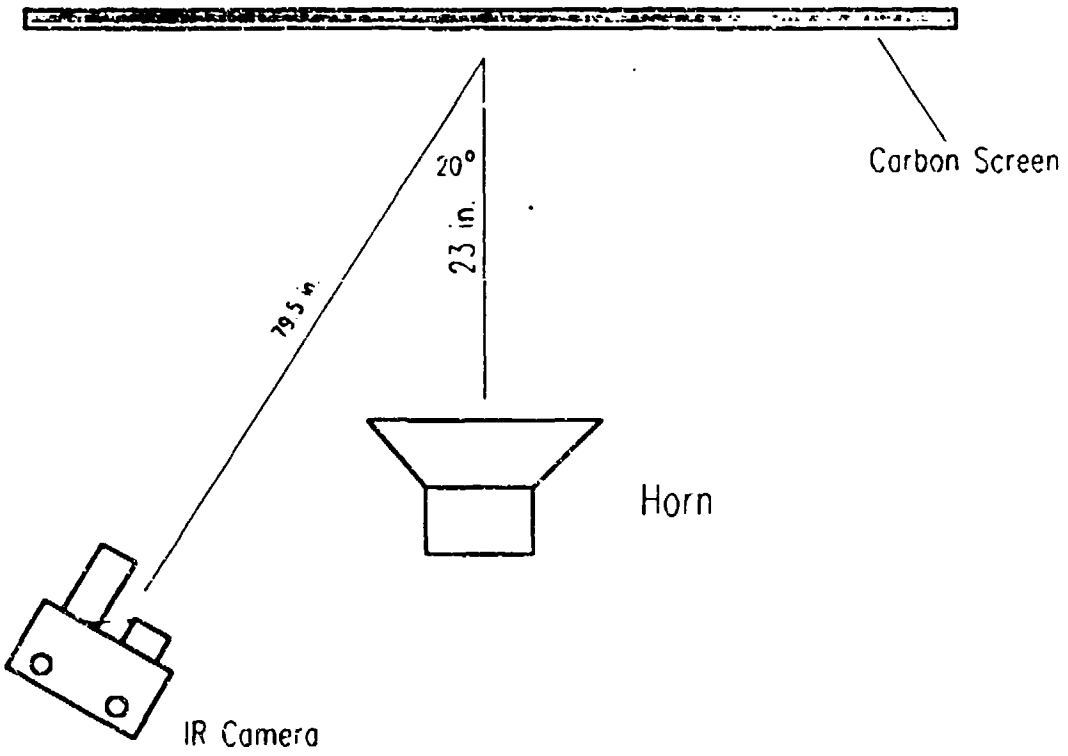


Figure B-2
Shot Number : 3007

Time of Recording : 2- 9-1989 , 15: 0

Frequency : 8 x 10^9 Hz

Thermal Range : 5

Thermal Level : 55

Ambient Temperature : 28.00°C

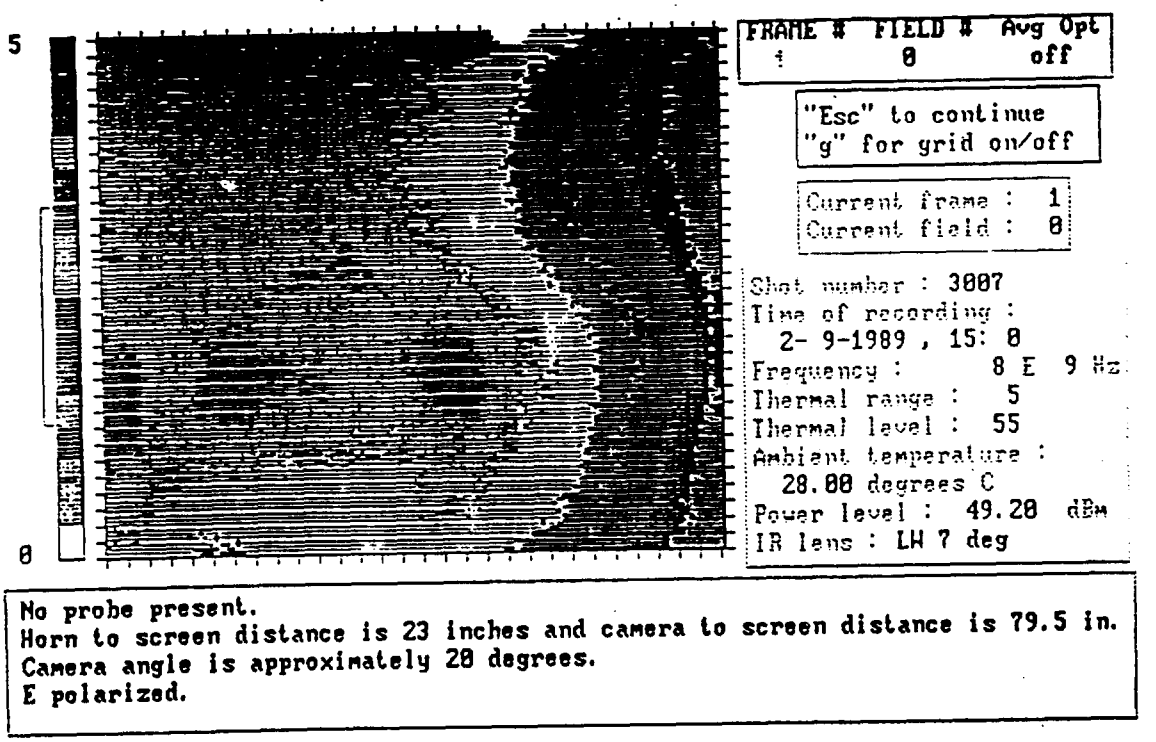
Power Level : 492 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : kr8g2n.raw

Comments :

No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.



No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

Figure B-3
Shot Number : 3008

Time of Recording : 2- 9-1989 , 15: 3

Frequency : 9 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

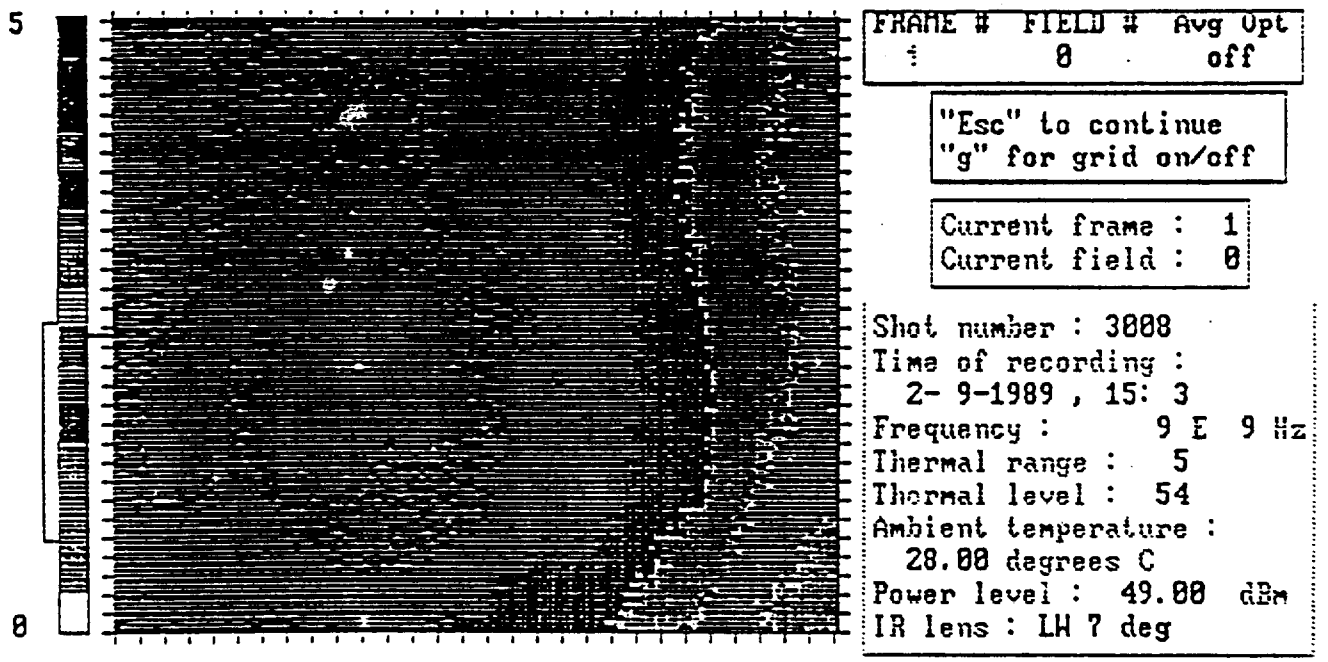
Power Level : 49 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr9gn.raw

Comments :

No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in
Camera angle is approximately 20 degrees.
E polarized.



No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

Figure B-4
Shot Number : 3009

Time of Recording : 2- 9-1989 , 15: 6

Frequency : 10 x 10^9 Hz

Thermal Range : 2

Thermal Level : 51

Ambient Temperature : 28.00°C

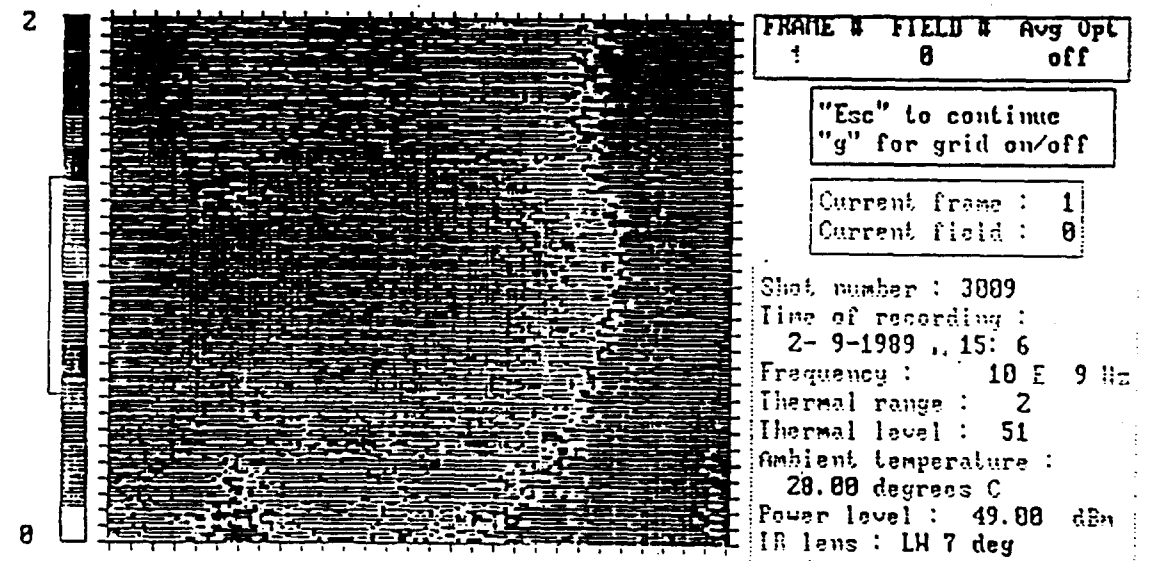
Power Level : 49 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr10gn.raw

Comments :

No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in
Camera angle is approximately 20 degrees.
E polarized.



No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

Figure B-5
Shot Number : 3010

Time of Recording : 2- 9-1989 , 15: 9

Frequency : 11 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 28.00°C

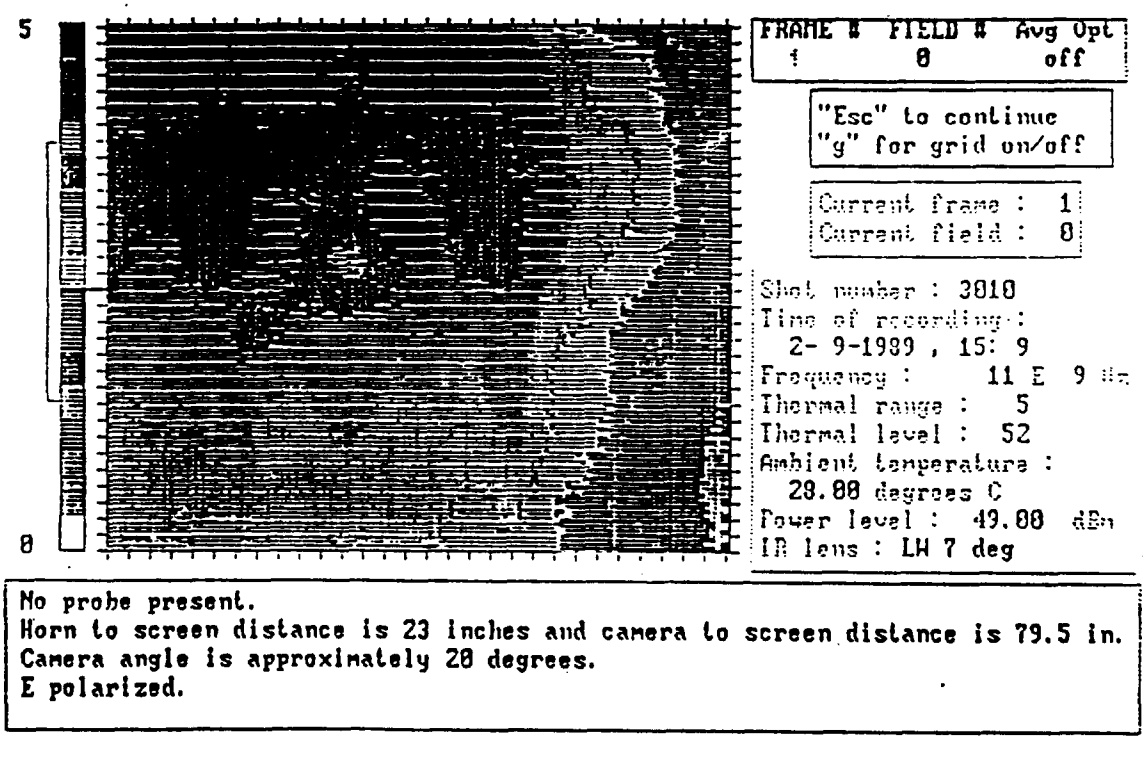
Power Level : 49 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr11g.raw

Comments :

No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.



No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

Figure B-6
Shot Number : 3011

Time of Recording : 2- 9-1989 , 15:12

Frequency : 12 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 28.00°C

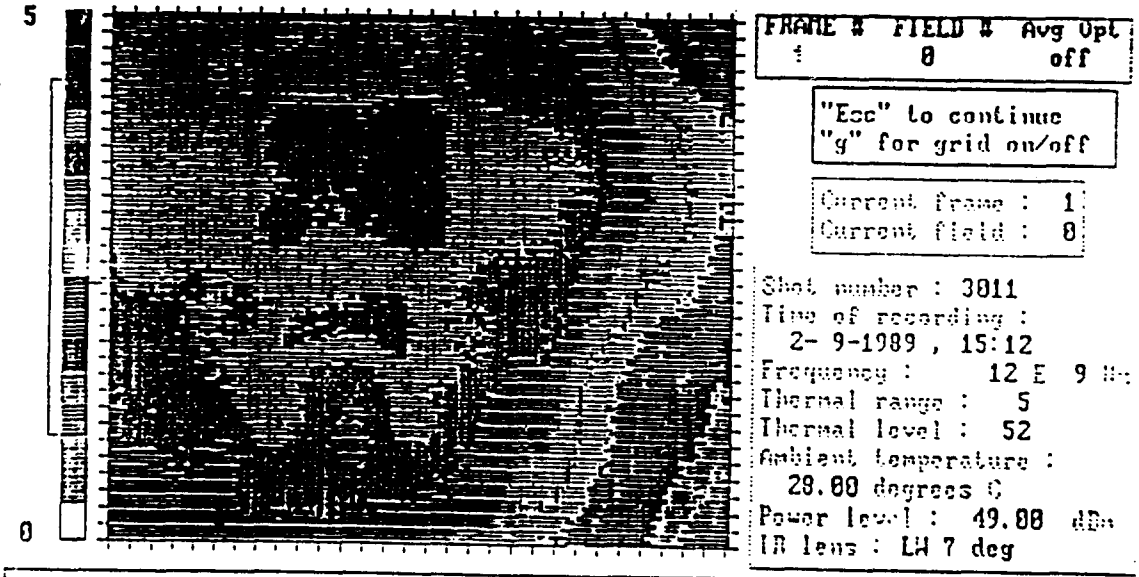
Power Level : 49 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr12gn.raw

Comments :

No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.



No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

Figure B-7
Shot Number : 3012

Time of Recording : 2- 9-1989 , 15:14

Frequency : 13 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

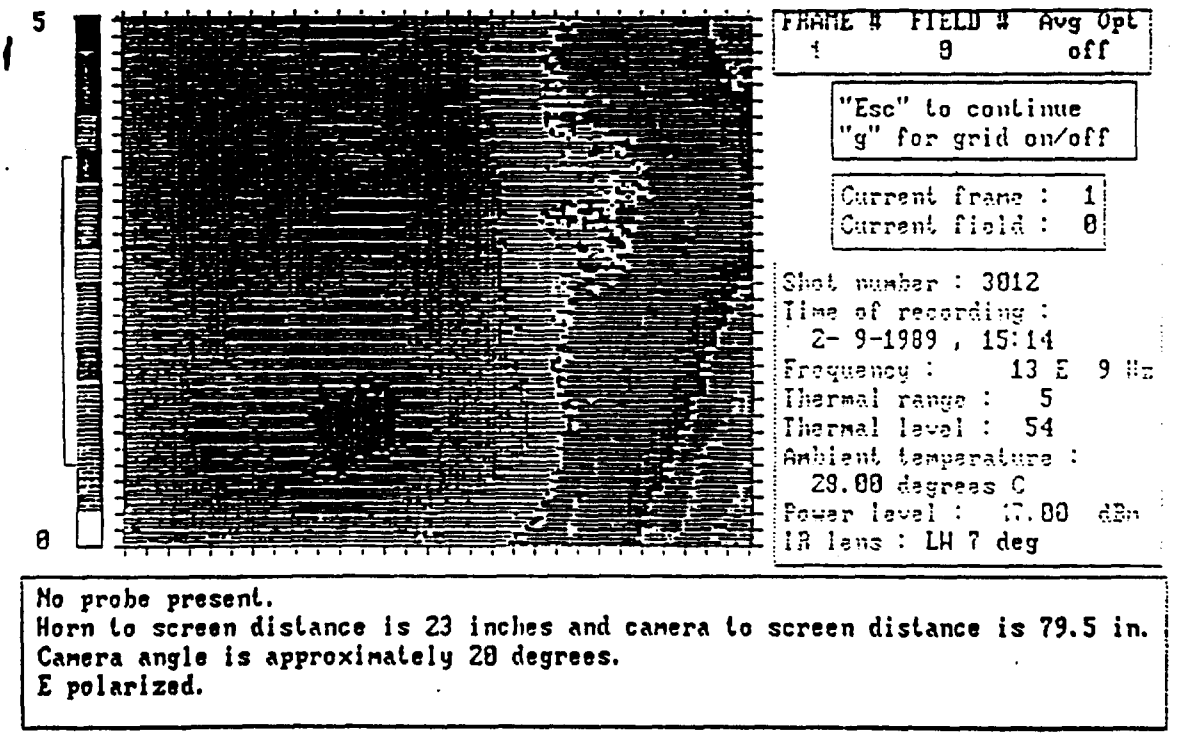
Power Level : 47 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr13gn.raw

Comments :

No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in
Camera angle is approximately 20 degrees.
E polarized.



No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

Figure B-8
Shot Number : 3013

Time of Recording : 2- 9-1989 , 15:16

Frequency : 14 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

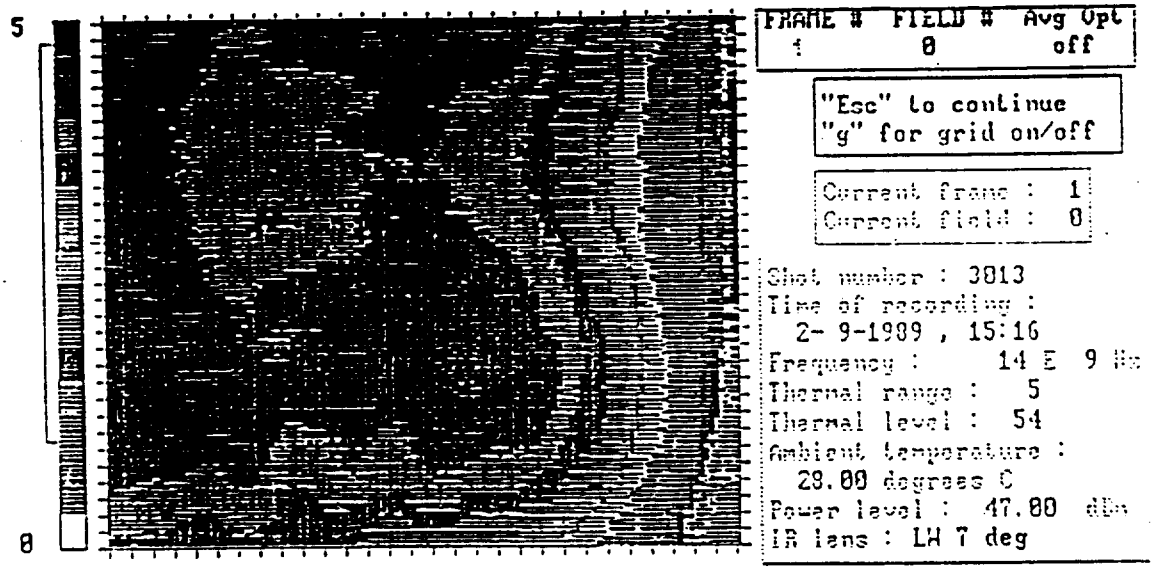
Power Level : 47 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr14gn.raw

Comments :

No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in
Camera angle is approximately 20 degrees.
E polarized.



No probe present.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

APPENDIX C

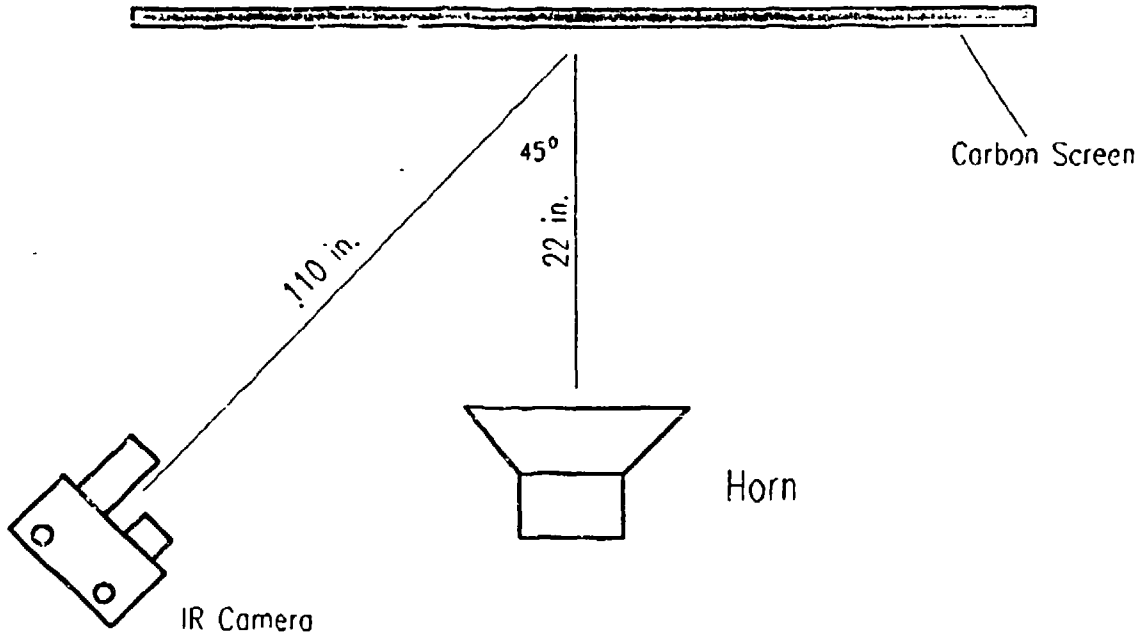
Ambient Free Space

Two Probe Reference Fields

(4 to 8 GHz)

Figure C-1

RADC PROBE STUDY
FREE FIELD CONFIGURATION
DETAILED TOP VIEW OF SET UP



CONFIGURATIONS A, B, and C

Figure C-2
Shot Number : 1025

Time of Recording : 1-10-1989 , 17:30

Frequency : 4 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

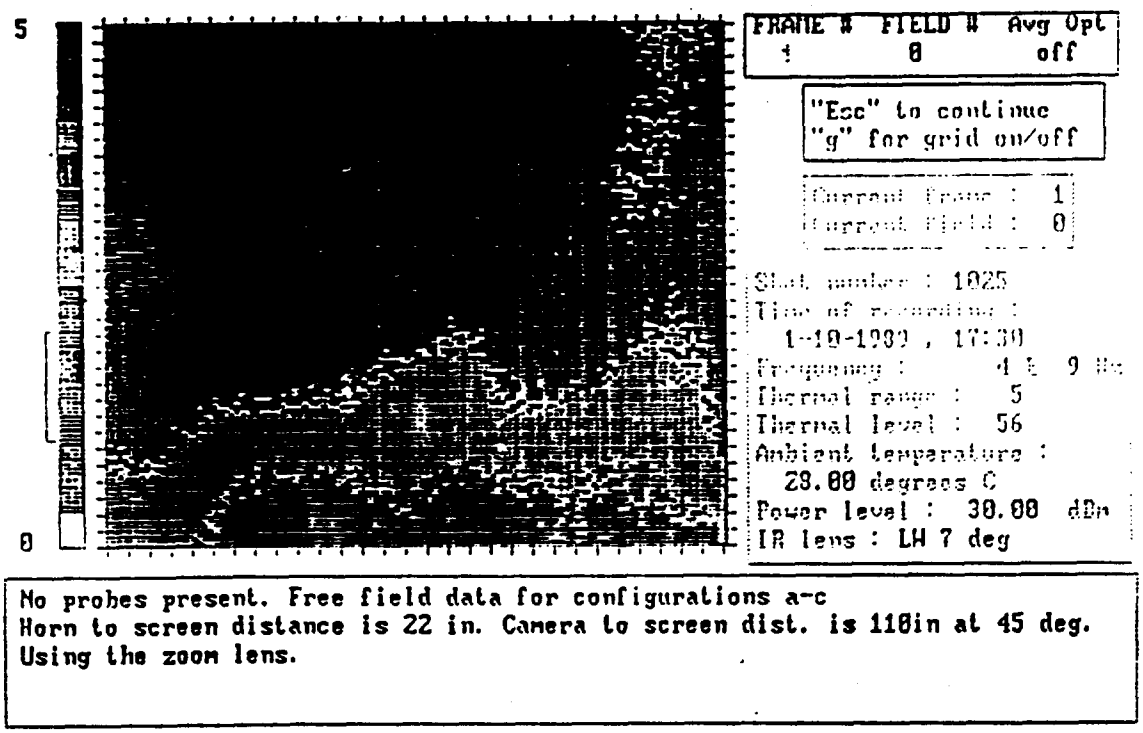
Power Level : 30 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r4g2n.raw

Comments :

No probes present. Free field data for configurations a-c
Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.



No probes present. Free field data for configurations a-c
Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.

Figure C-3
Shot Number : 1026

Time of Recording : 1-10-1989 , 17:33

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

Power Level : 40 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r5g2n.raw

Comments :

No probes present. Free field data for configurations a-c
Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.

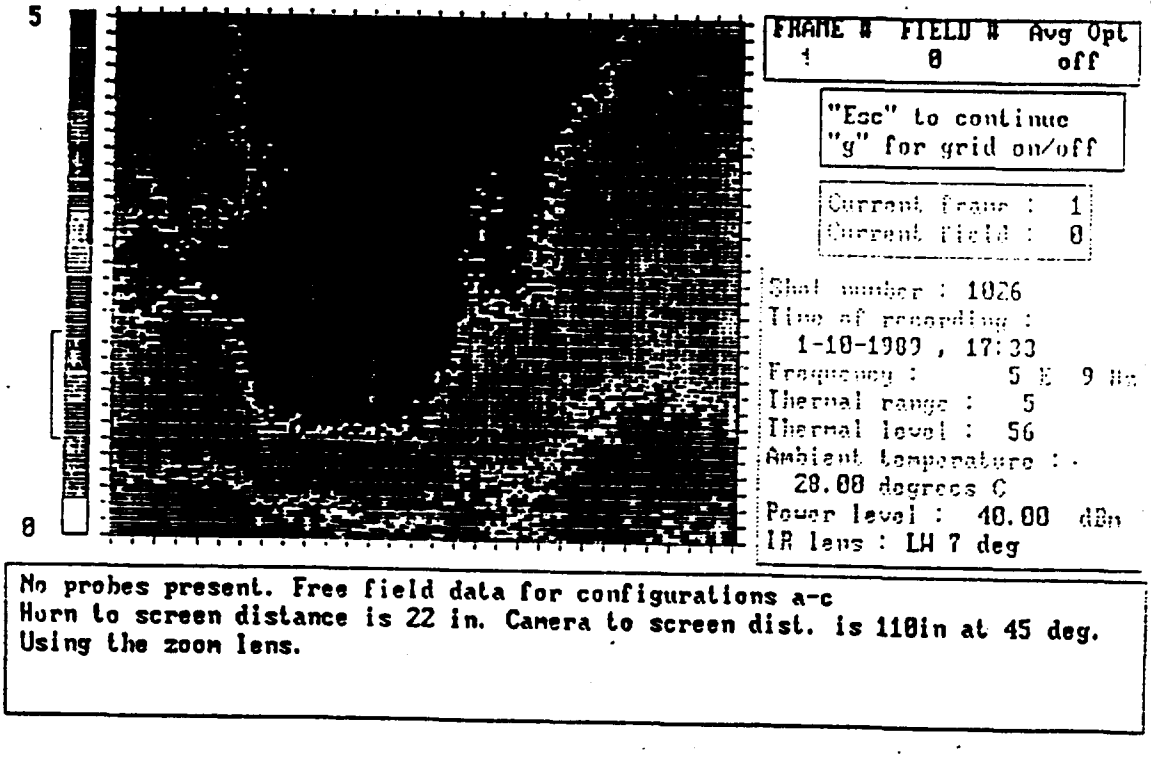


Figure C-4
Shot Number : 1027

Time of Recording : 1-10-1989 , 17:35

Frequency : 6 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

Power Level : 30 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r6g2n.raw

Comments :

No probes present. Free field data for configurations a-c
Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.

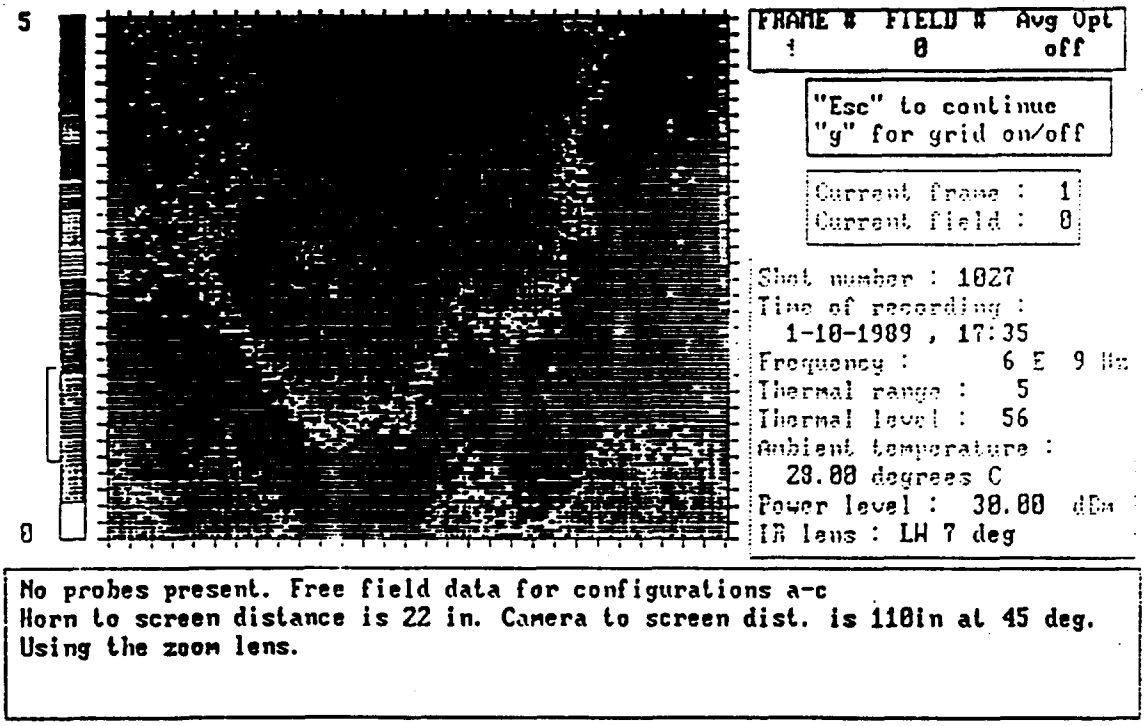


Figure C-5
Shot Number : 1028

Time of Recording : 1-10-1989 , 17:36

Frequency : 7 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

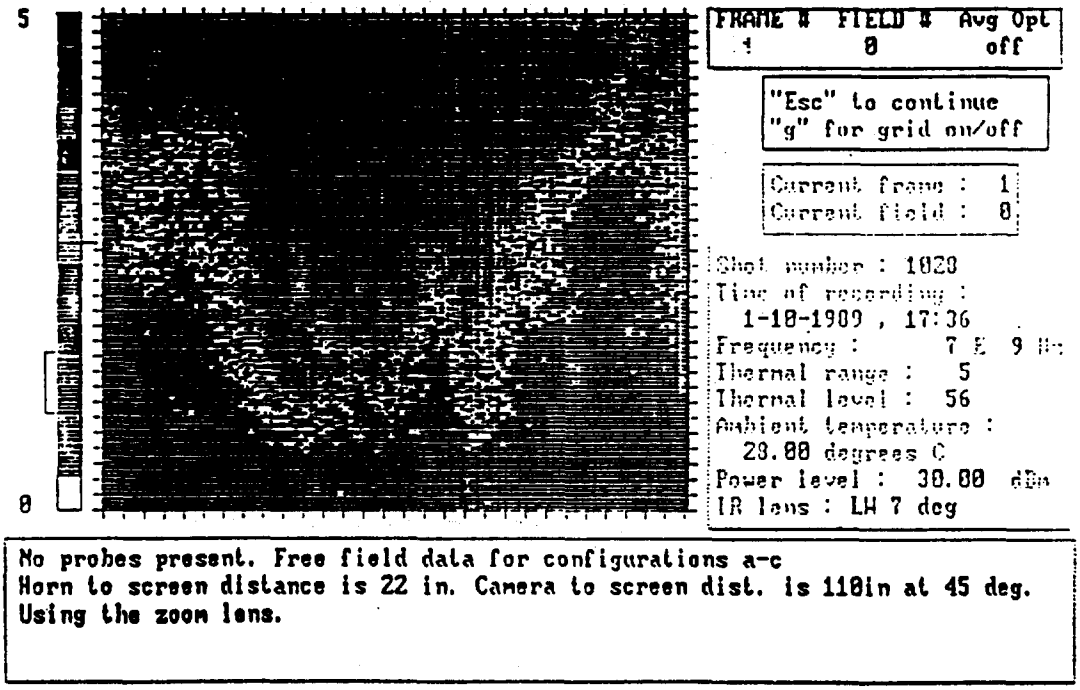
Power Level : 30 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r7g2n.raw

Comments :

No probes present. Free field data for configurations a-c
Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.



No probes present. Free field data for configurations a-c
Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.

Figure C-6
Shot Number : 1029

Time of Recording : 1-10-1999 , 17:38

Frequency : 8 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

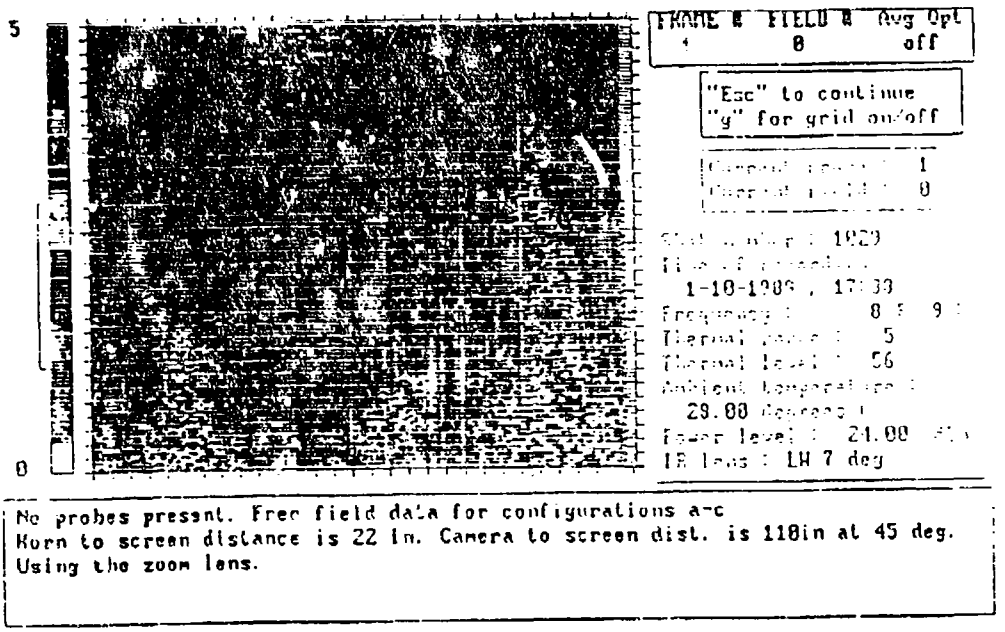
Power Level : 24 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r8g2n.raw

Comments :

No probes present. Free field data for configurations a-c
Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens



APPENDIX D

DATA: Single Probe

(1 to 4 GHz)

Figure D-1

RADC PROBE STUDY
SINGLE PROBE CONFIGURATION
DETAILED TOP VIEW OF SET UP

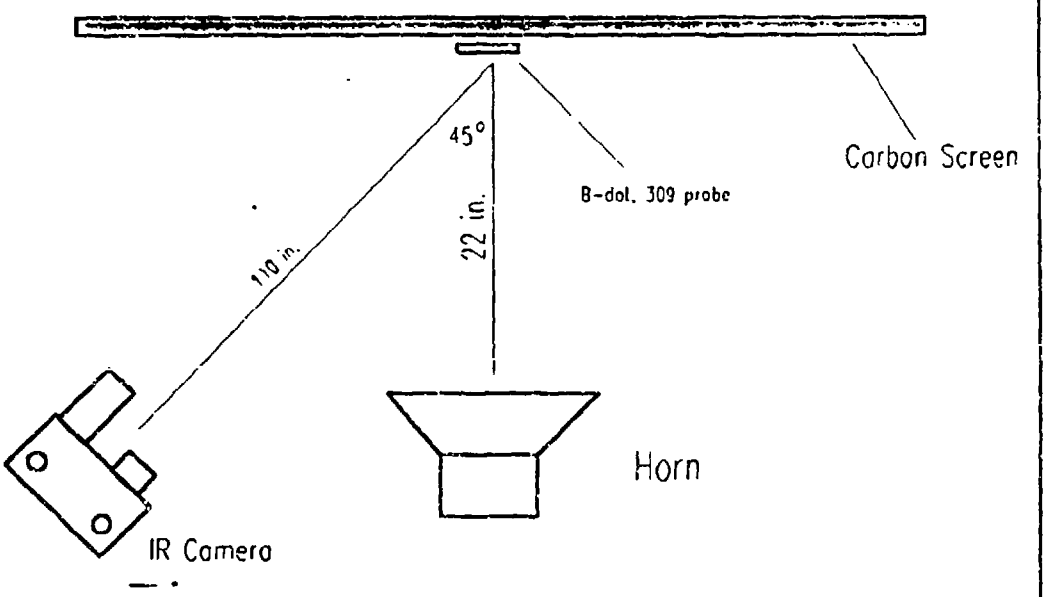


Figure D-2

Shot Number : 2016

Time of Recording : 1-11-1989 , 16:51

Frequency : 1 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

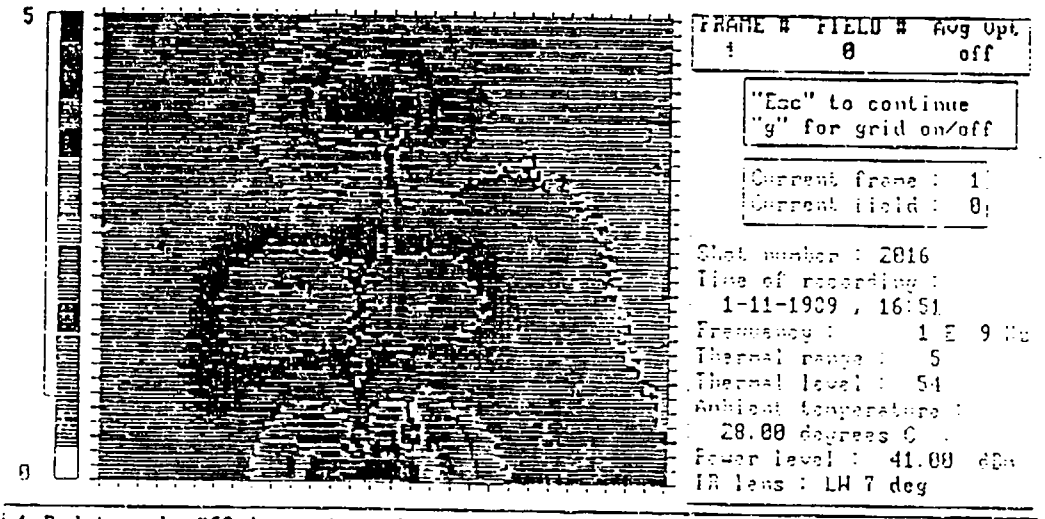
Power Level : 41 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : krig.raw

Comments :

1 B dot probe 309 in center of screen.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.



1 B dot probe 309 in center of screen.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

Figure D-3
Shot Number : 2017

Time of Recording : 1-11-1989 , 16:53

Frequency : 1.5 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

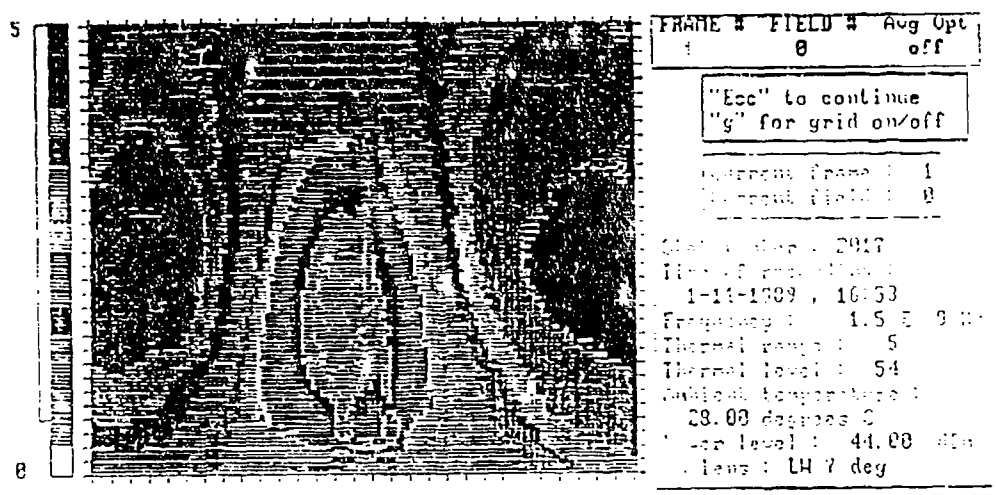
Power Level : 44 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : kr1_5g.raw

Comments :

1 B dot probe 309 in center of screen.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.



1 B dot probe 309 in center of screen.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

Figure D-4
Shot Number : 2018

Time of Recording : 1-11-1989 , 15:55

Frequency : 2 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

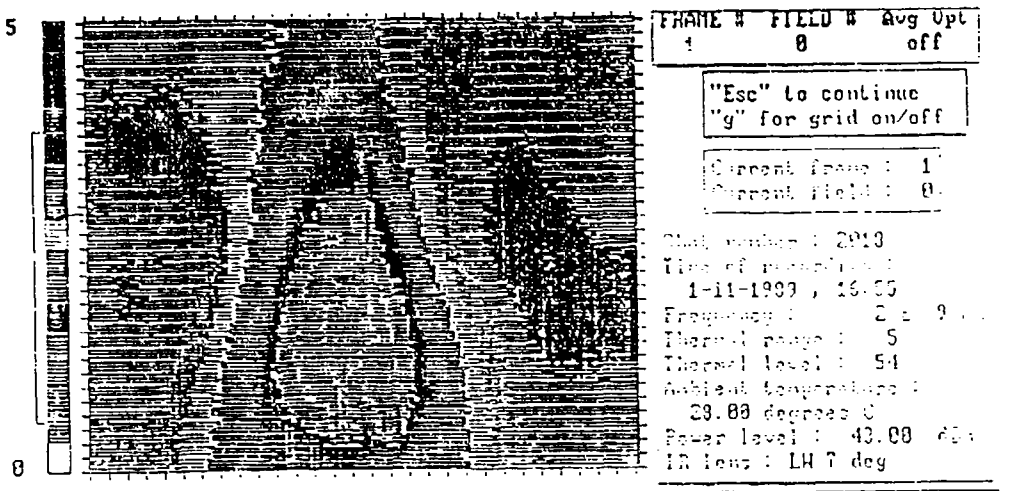
Power Level : 43 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : kr2g.raw

Comments :

1 B dot probe 309 in center of screen.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.



1 B dot probe 309 in center of screen.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

Figure D-5
Shot Number : 2019

Time of Recording : 1-11-1989 , 17: 3

Frequency : 3 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 29.00°C

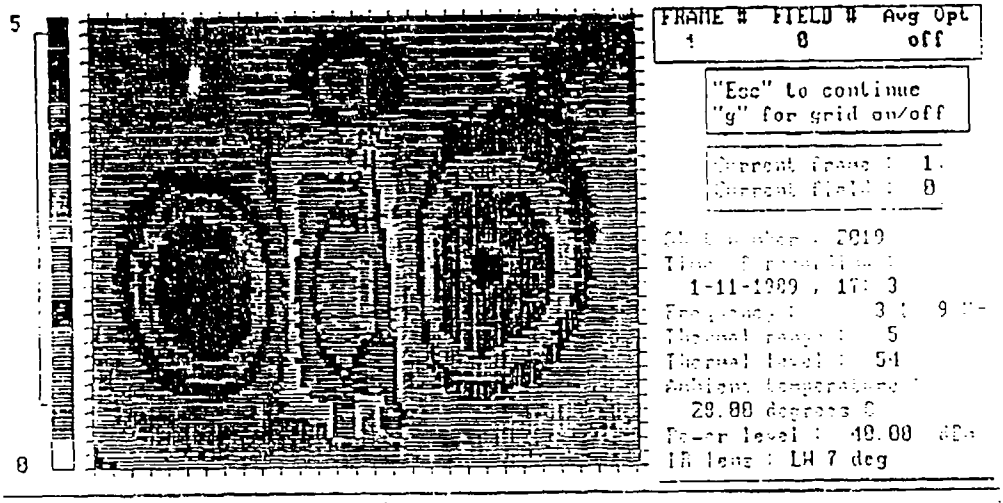
Power Level : 40 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : kr3g.raw

Comments :

1 8 dot probe 309 in center of screen.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg..
Using zoom lens.



1 8 dot probe 309 in center of screen.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

Figure D-6
Shot Number : 2020

Time of Recording : 1-11-1989 , 17: 5

Frequency : 4 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 29.00°C

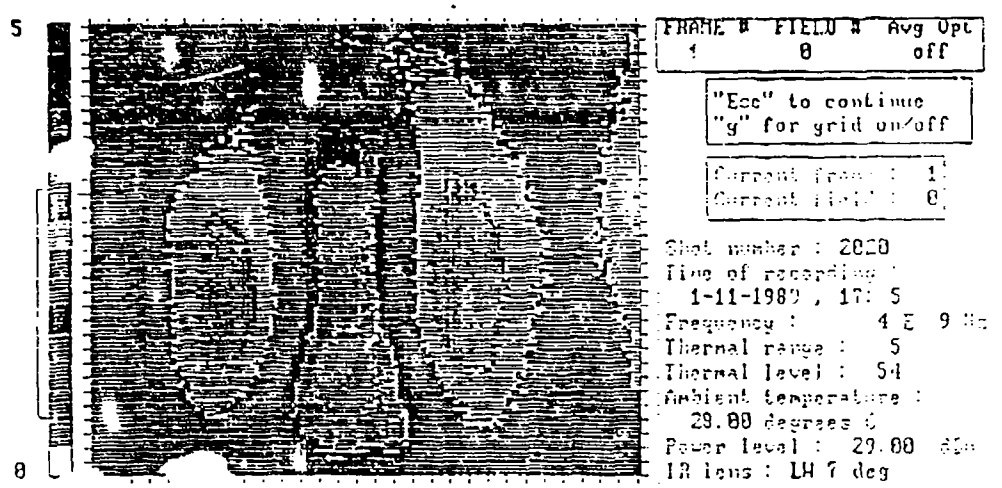
Power Level : 29 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : kr4g2.raw

Comments :

1 6 dot probe 309 in center of screen.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.



1 6 dot probe 309 in center of screen.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

APPENDIX E

DATA: Single Probe

(4 to 8 GHz)

Figure E-1

RADC PROBE STUDY
SINGLE PROBE CONFIGURATION
DETAILED TOP VIEW OF SET UP

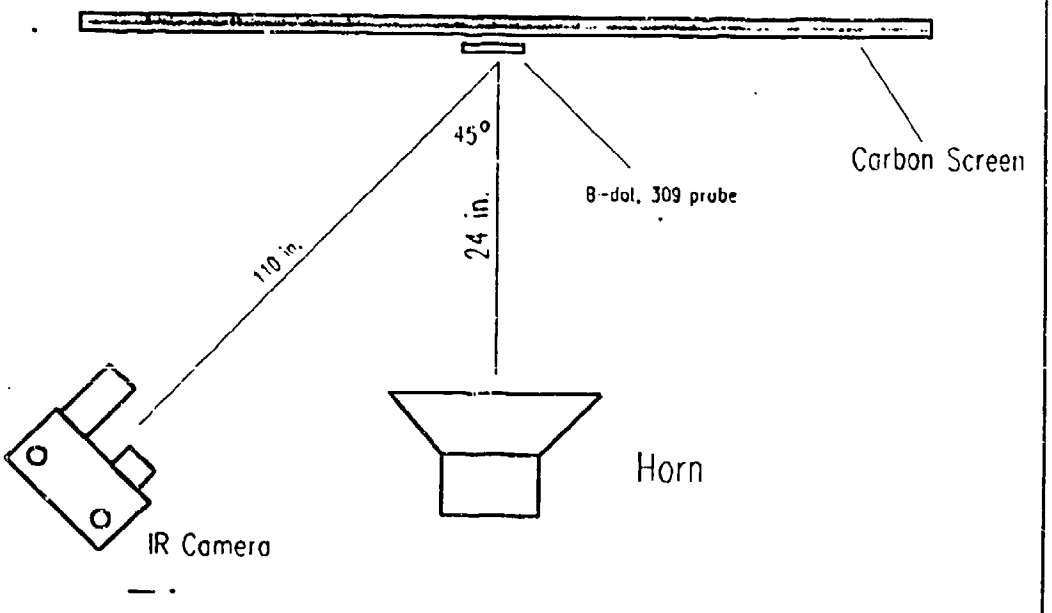


Figure E-2

Shot Number : 1005

Time of Recording : 1-10-1989 , 12:53

Frequency : 4 x 10^9 Hz

Thermal Range : 05

Thermal Level : 54

Ambient Temperature : 28.00°C

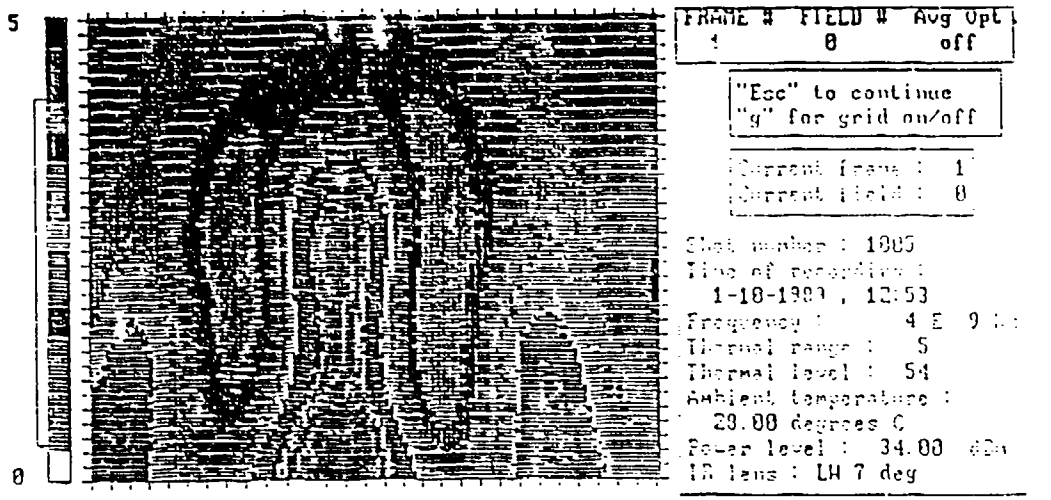
Power Level : 34 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr4g.raw

Comments :

8 dot probe 303 present in the center of screen
Horn to screen distance is 24 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.
Note:Source is producing harmonics at 7.3and 8ghz, see no problem at this time.



8 dot probe 309 present in the center of screen
Horn to screen distance is 24 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.
Note:Source is producing harmonics at 7.3and 8ghz, see no problem at this time.

Figure E-3

Shot Number : 1006

Time of Recording : 1-10-1989 , 13: 0

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

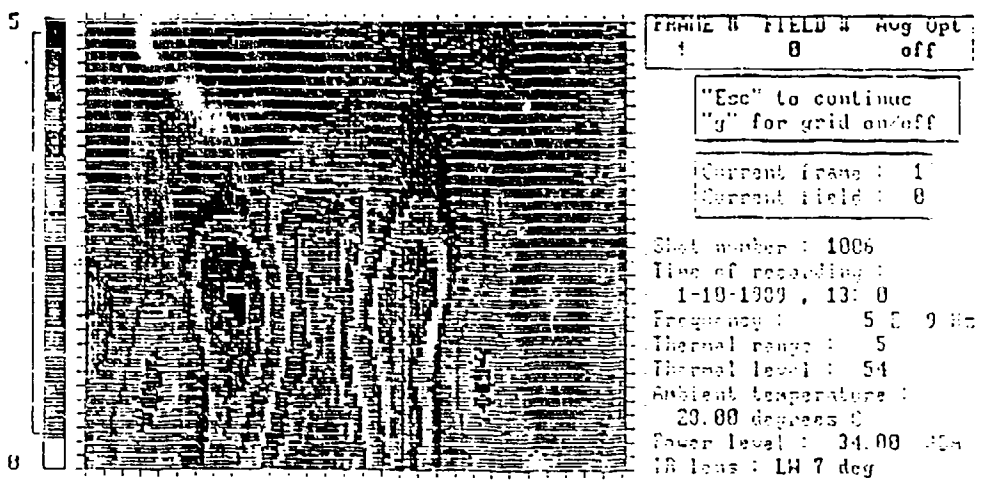
Power Level : 34.8 0

IR Camera Lens : Long Wave, f/1.3, 7°

Name of Stored Data File : kr5g.raw

Comments :

8 dot probe 309 present in the center of screen
Horn to screen distance is 24 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.
Note:Source is producing harmonics at 7.3and 8ghz, see no problem at this time.



8 dot probe 309 present in the center of screen
Horn to screen distance is 24 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.
Note:Source is producing harmonics at 7.3and 8ghz, see no problem at this time.

Figure E-4

Shot Number : 1007

Time of Recording : 1-10-1999 , 13:11

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

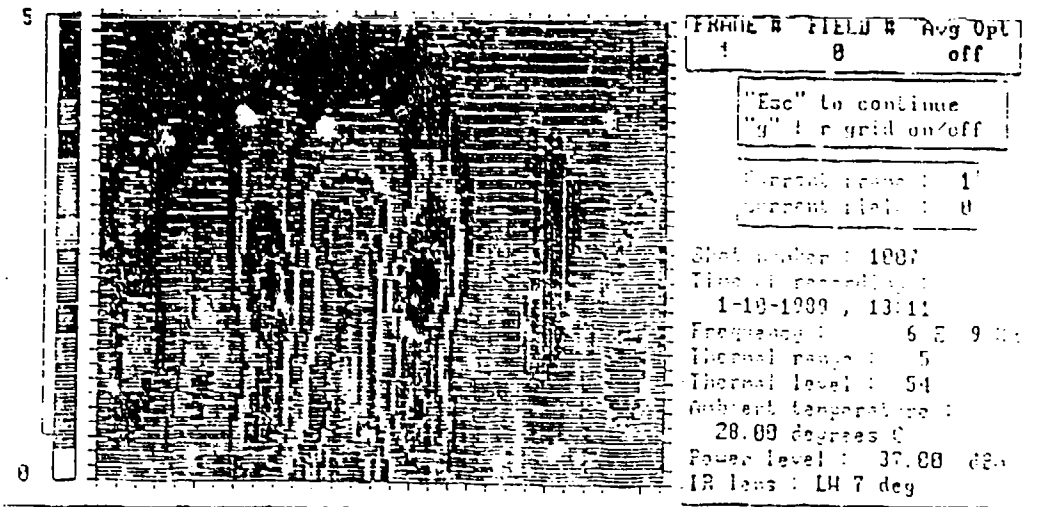
Power Level : 37.5 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : hr6g.raw

Comments :

S dot probe 309 present in the center of screen
Horn to screen distance is 24 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.
Note:Source is producing harmonics at 4.3ghz, see no problem at this time.



S dot probe 309 present in the center of screen
Horn to screen distance is 24 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.
Note:Source is producing harmonics at 4.3ghz, see no problem at this time.

Figure E-5
Shot Number : 1008

Time of Recording : 1-10-1989 , 13:13

Frequency : 7 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

Power Level : 37 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : kr7g.raw

Comments :

5 dot probe 309 present in the center of screen
Horn to screen distance is 24 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.
Note:Source is producing harmonics at 6.3ghz, see no problem at this time.

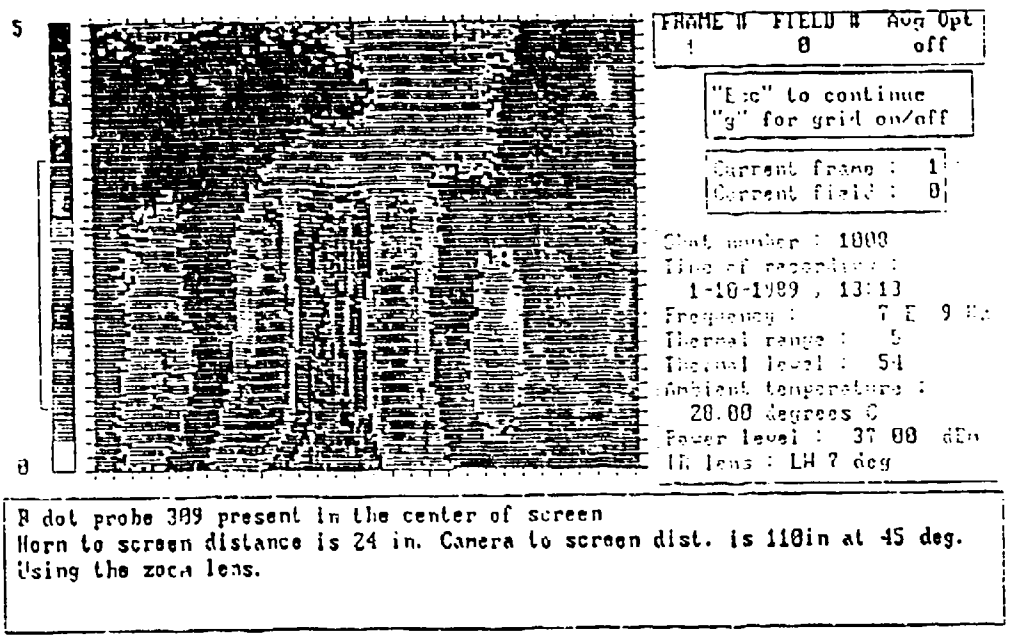


Figure E-6 .

Shot Number : 1009

Time of Recording : 1-10-1989 , 13:16

Frequency : 3 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

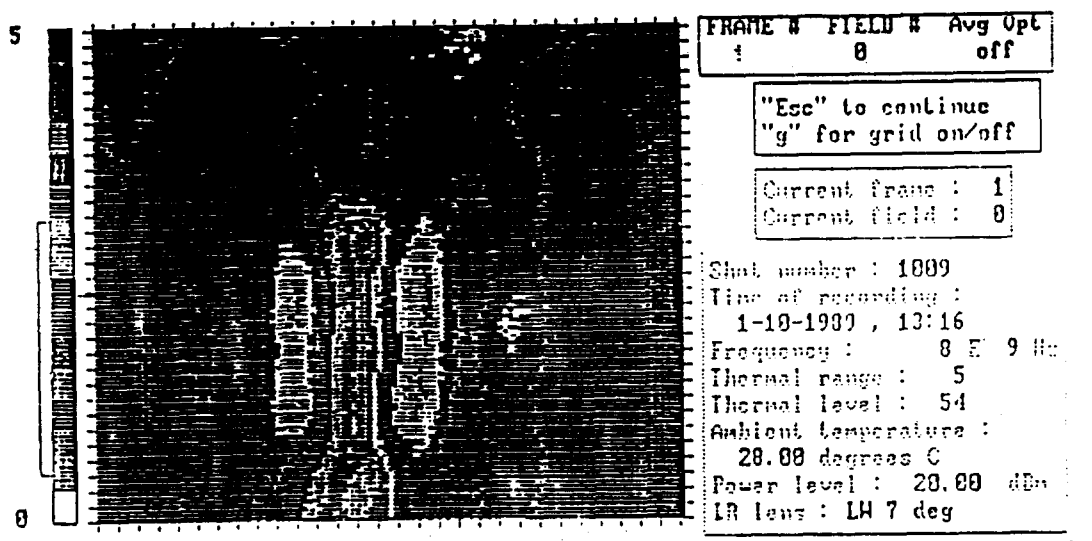
Power Level : 20 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr8g.raw

Comments :

8 dot probe 309 present in the center of screen
Horn to screen distance is 24 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.
Note:Source is producing harmonics at 6.3 and 7.3ghz, see no problem at this time.



8 dot probe 309 present in the center of screen
Horn to screen distance is 24 in. Camera to screen dist. is 110in at 45 deg.
Using the zoom lens.
Note:Source is producing harmonics at 6.3 and 7.3ghz, see no problem at this time.

APPENDIX F

DATA: Single Probe

(8 to 14 GHz)

Figure F-1

RADC PROBE STUDY
SINGLE PROBE CONFIGURATION
DETAILED TOP VIEW OF SET UP

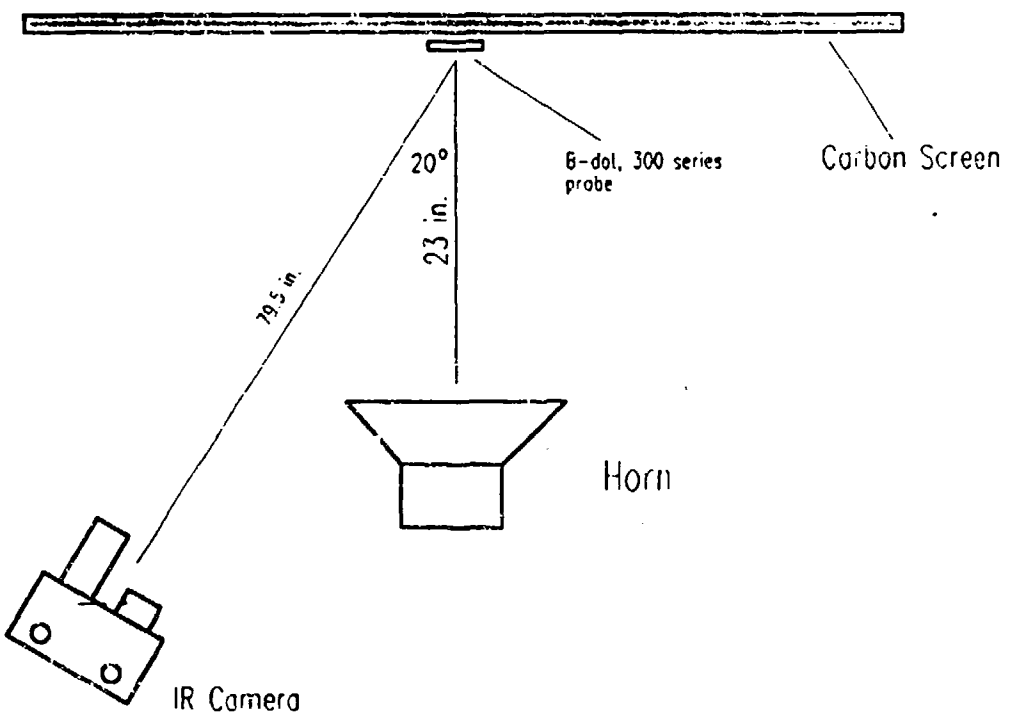


Figure F-2
Shot Number : 3000

Time of Recording : 2- 9-1989 , 12:25

Frequency : 8 x 10^9 Hz

Thermal Range : 5

Thermal Level : 53

Ambient Temperature : 28.00°C

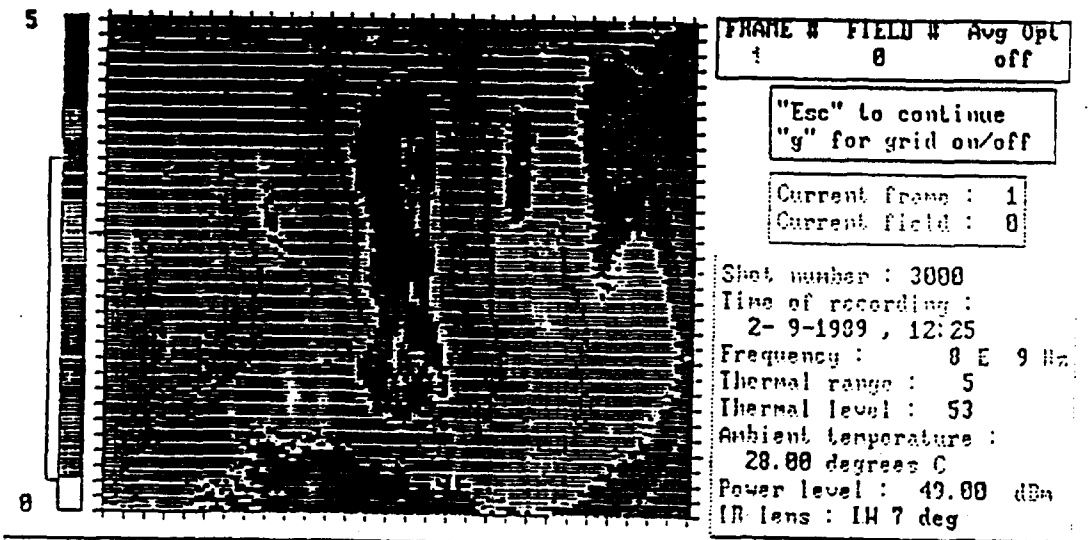
Power Level : 49 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : kr8g2.raw

Comments :

Single probe 300 series B-Dot in center of screen.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.



**Single probe 300 series B-Dot in center of screen.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.**

Figure F-3
Shot Number : 3001

Time of Recording : 2- 9-1989 , 14: 1

Frequency : 9 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 28.00°C

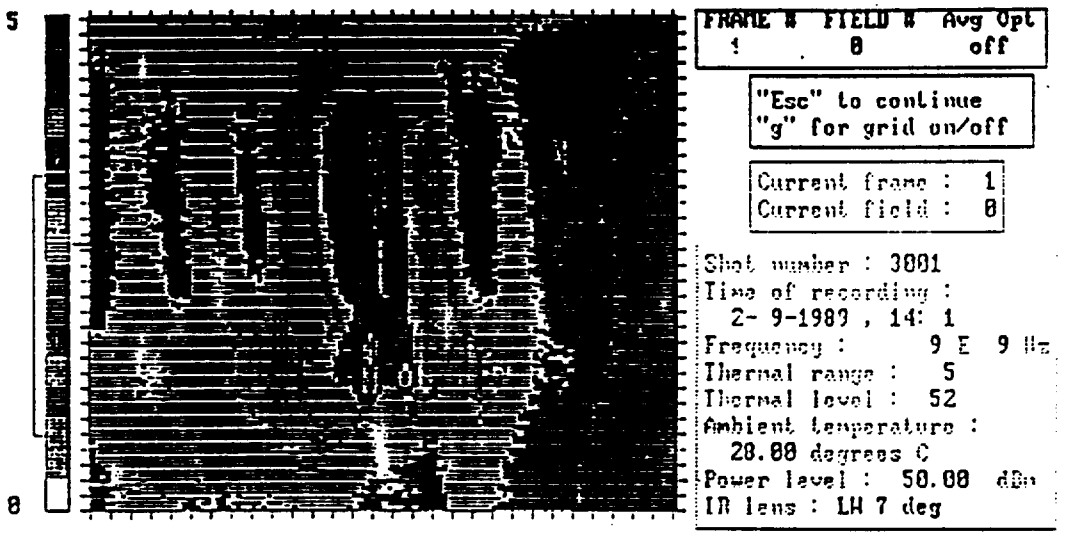
Power Level : 50 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr9g.raw

Comments :

Single probe 300 series B-Dot in center of screen.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in
Camera angle is approximately 20 degrees.
E polarized.



Single probe 300 series B-Dot in center of screen.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

Figure F-4
Shot Number : 3002

Time of Recording : 2- 9-1989 , 14: 4

Frequency : 10 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 28.00°C

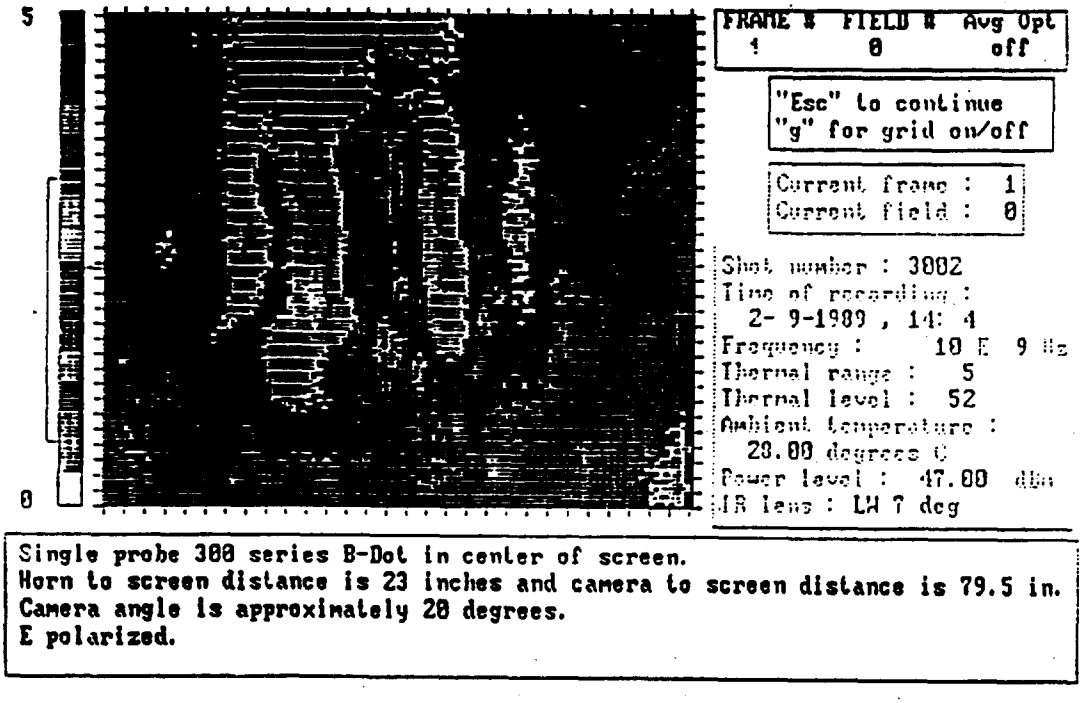
Power Level : 47 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr10g.raw

Comments :

Single probe 300 series B-Dot in center of screen.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.



Single probe 300 series B-Dot in center of screen.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

0:54

Figure F-5

Frequency : 11 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 27.00°C

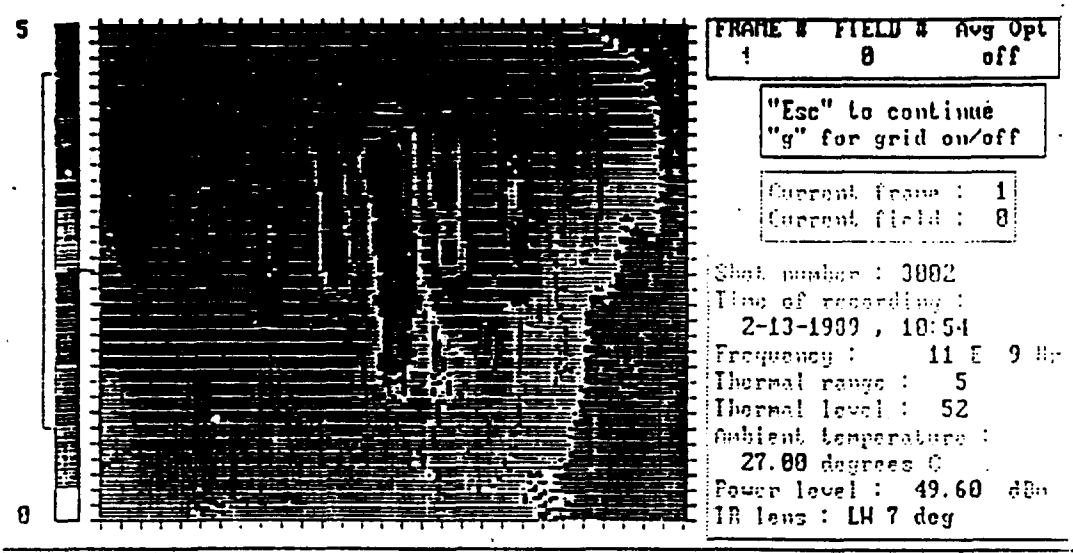
Power Level : 496 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr11g.raw

Comments :

Single probe 300 series B-dot in center of screen.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E-polarized.



Single probe 300 series B-dot in center of screen.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E-polarized.

Figure F-6

Shot Number : 3004

Time of Recording : 2- 9-1989 , 14:43

Frequency : 12 x 10^9 Hz

Thermal Range : 10

Thermal Level : 58

Ambient Temperature : 28.00°C

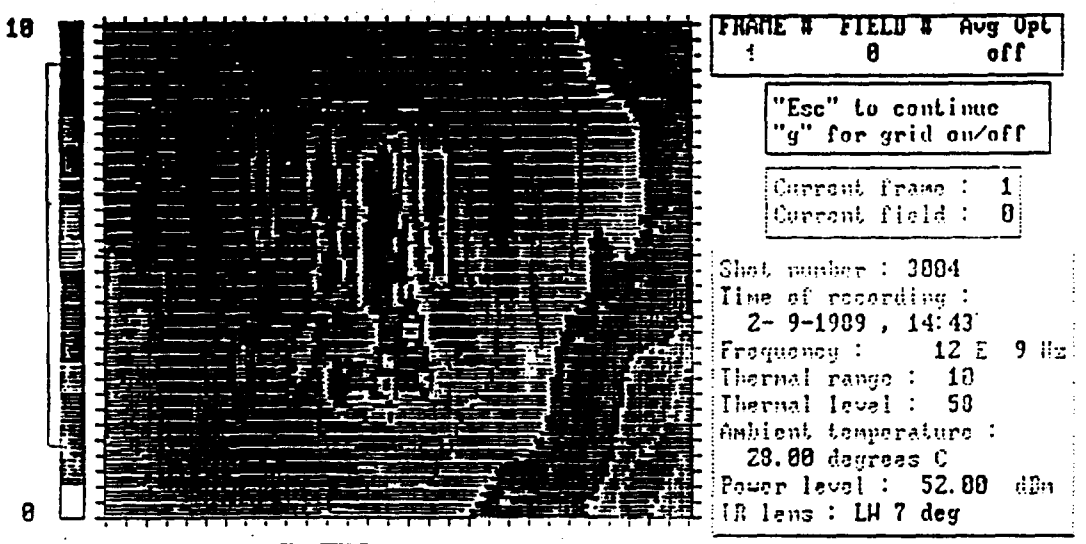
Power Level : 52 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr12g.raw

Comments :

Single probe 300 series B-Dot in center of screen.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.



Single probe 300 series B-Dot in center of screen.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

Figure F-7

Shot Number : 3005

Time of Recording : 2- 9-1989 , 14:46

Frequency : 13 x 10^9 Hz

Thermal Range : 10

Thermal Level : 58

Ambient Temperature : 28.00°C

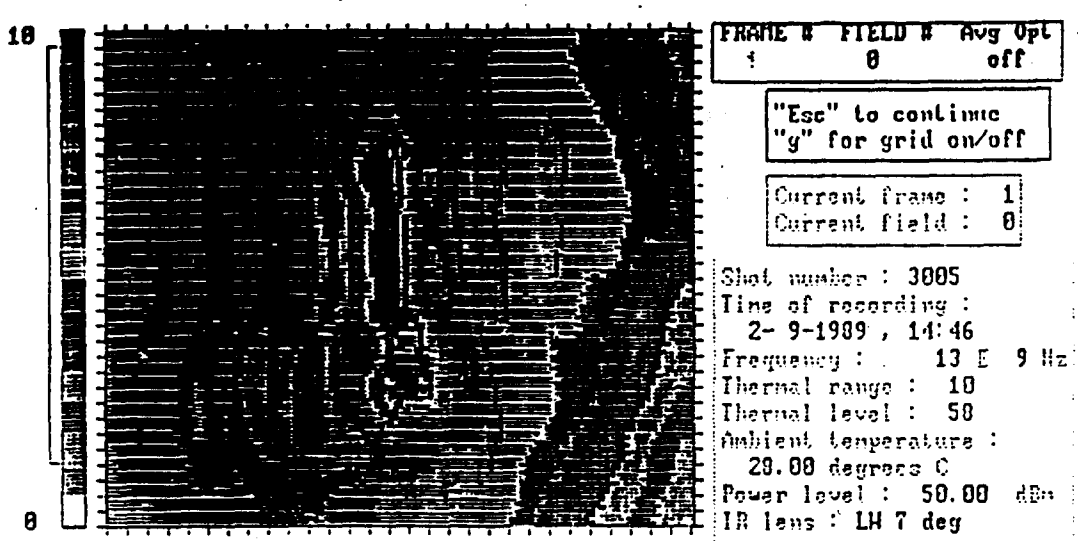
Power Level : 50 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr13g.raw

Comments :

Single probe 300 series B-Dot in center of screen.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 i
Camera angle is approximately 20 degrees.
E polarized.



Single probe 300 series B-Dot in center of screen.
Horn to screen distance is 23 inches and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E polarized.

Figure F-8

Shot Number : 3006

Time of Recording : 2-10-1989 , 16: 2

Frequency : 14 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

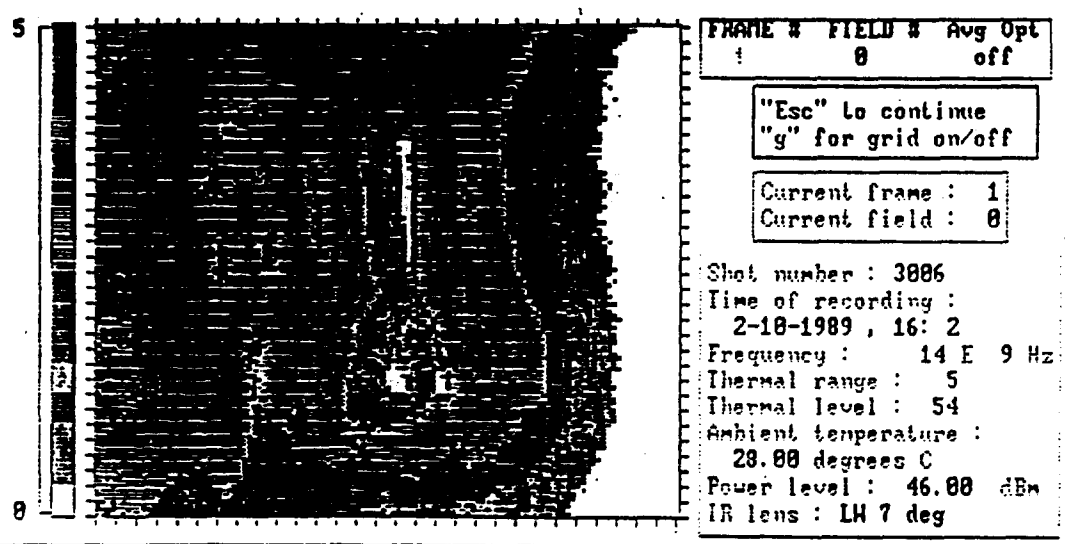
Power Level : 46 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : kr14g$.raw

Comments :

Single probe 300 series B-dot in center of screen.
Horn to screen distance is 23 in and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E-polarized.



**Single probe 300 series B-dot in center of screen.
Horn to screen distance is 23 in and camera to screen distance is 79.5 in.
Camera angle is approximately 20 degrees.
E-polarized.**

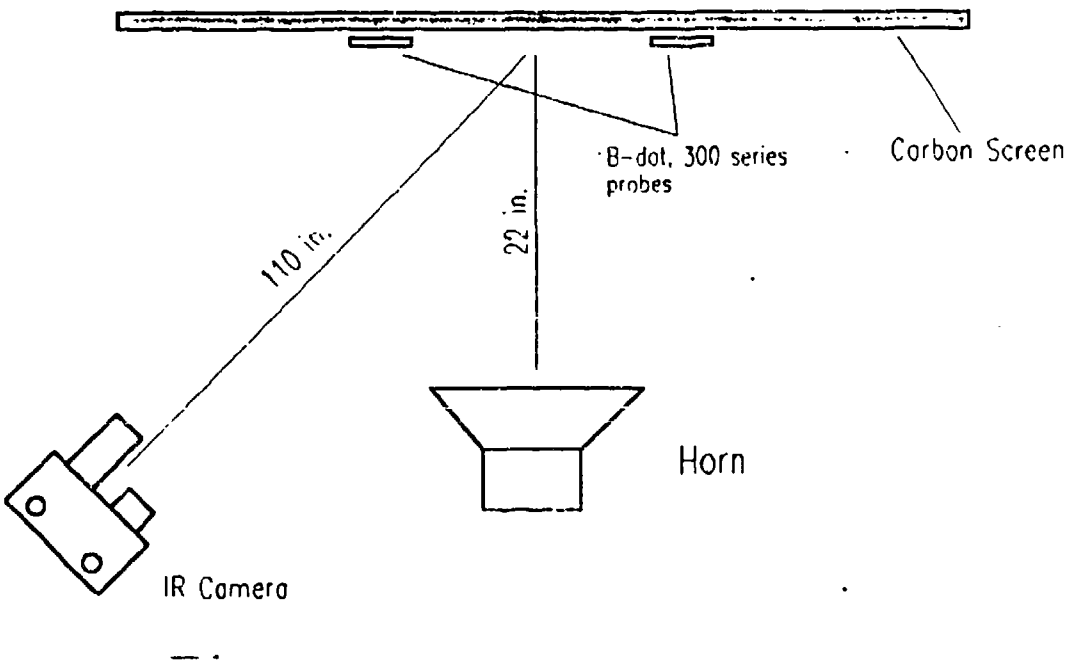
APPENDIX G

DATA: Two Probes

(5.75" separation)

Figure G-1

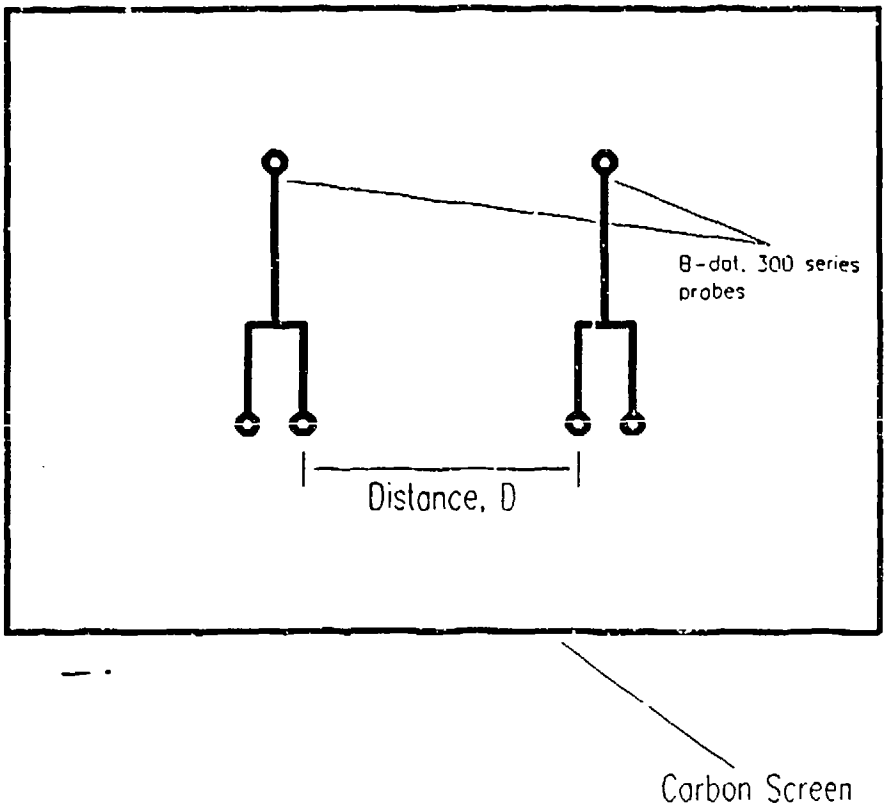
RADC PROBE STUDY
TWO-PROBE CONFIGURATION
DETAILED TOP VIEW OF SET UP



CONFIGURATIONS A, B, and C

Figure G-2

RADC PROBE STUDY
TWO-PROBE CONFIGURATION
CAMERA VIEW



CONFIGURATION C : Distance D = 5.75 in.

Figure G-3
Shot Number : 2003

Time of Recording : 1-11-1989 , 15:22

Frequency : 1 x 10^9 Hz

Thermal Range : 2

Thermal Level : 52

Ambient Temperature : 28.00°C

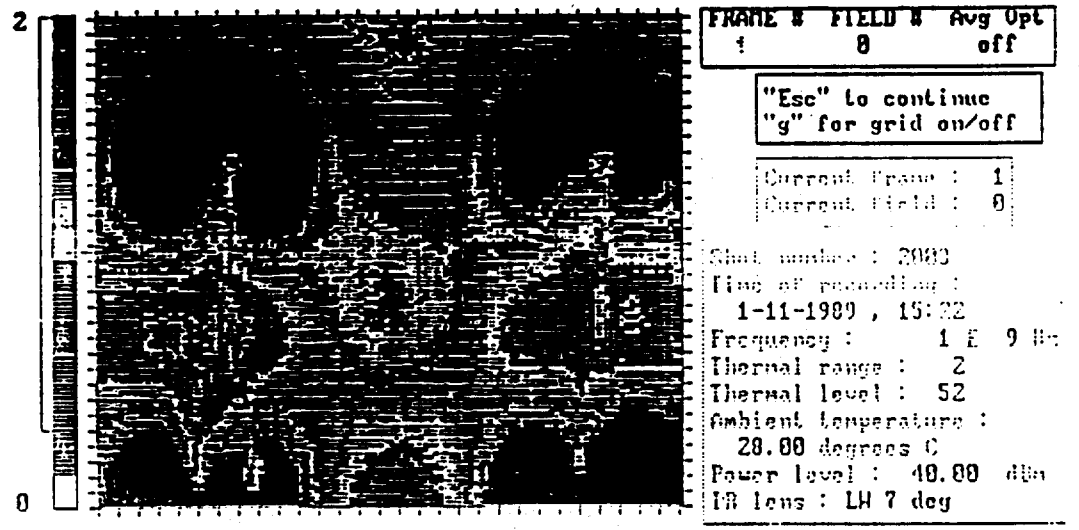
Power Level : 40 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : rig2pc.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 5.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 5.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.

Figure G-4
Shot Number : 2004

Time of Recording : 1-11-1989 , 15:24

Frequency : 1.5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

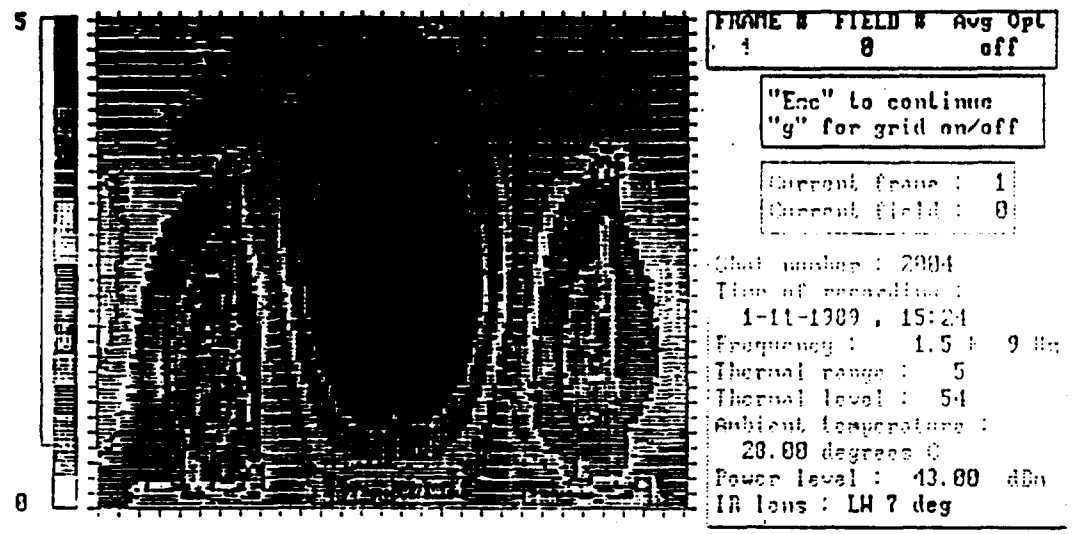
Power Level : 43 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r15g2pc.raw

Comments :.

2 B dot probes 309 and 308 present in center of screen, 5.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 5.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

Figure G-5
Shot Number : 2000

Time of Recording : 1-11-1989 , 15: 5

Frequency : 2 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

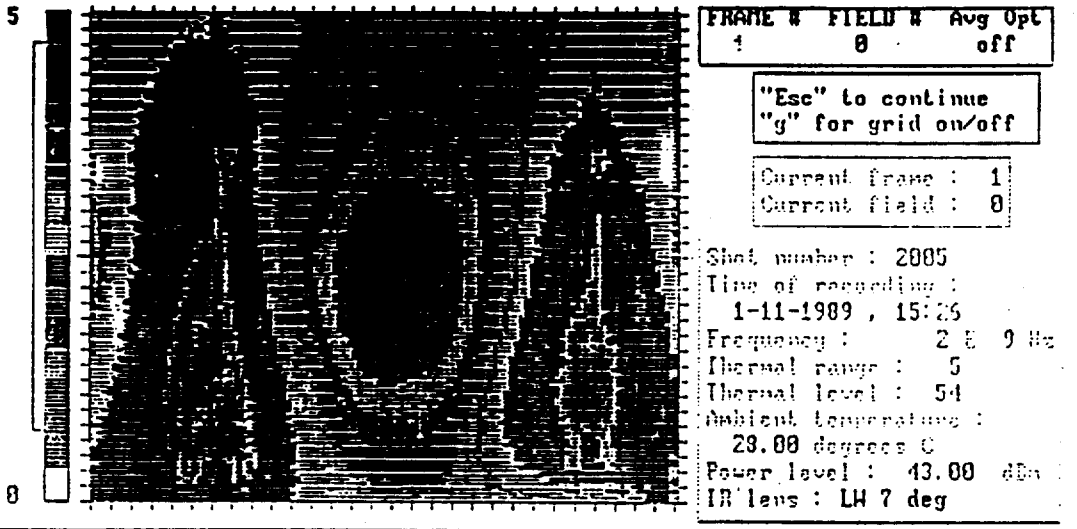
Power Level : 43 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r2g2pc.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 5.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 5.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.

Figure G-6

Shot Number : 2005

Time of Recording : 1-11-1989 , 15:26

Frequency : 2 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

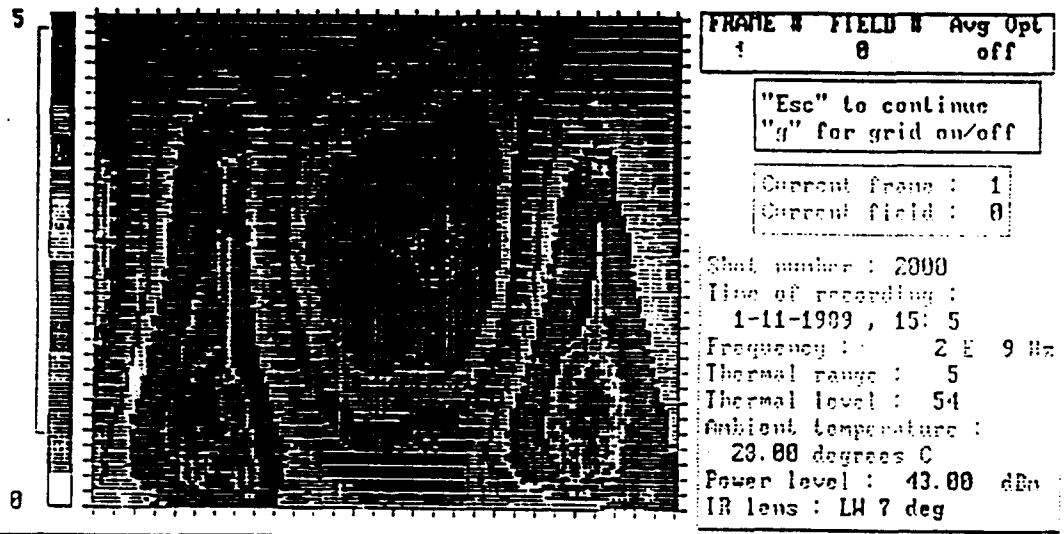
Power Level : 43 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r2g2p2c.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 5.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 5.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

Figure G-7
Shot Number : 2001

Time of Recording : 1-11-1989 , 15:10

Frequency : 3 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

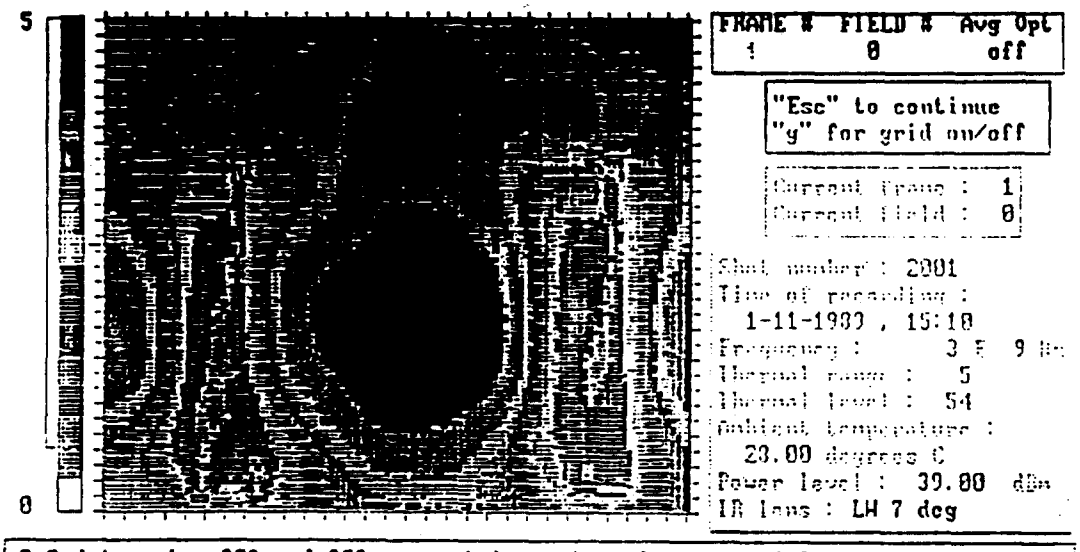
Power Level : 39 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r3g2pc.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 5.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 5.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

Figure G-8
Shot Number : 1020

Time of Recording : 1-10-1989 , 17:17

Frequency : 4 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

Power Level : 20 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r4g2pc.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 5.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

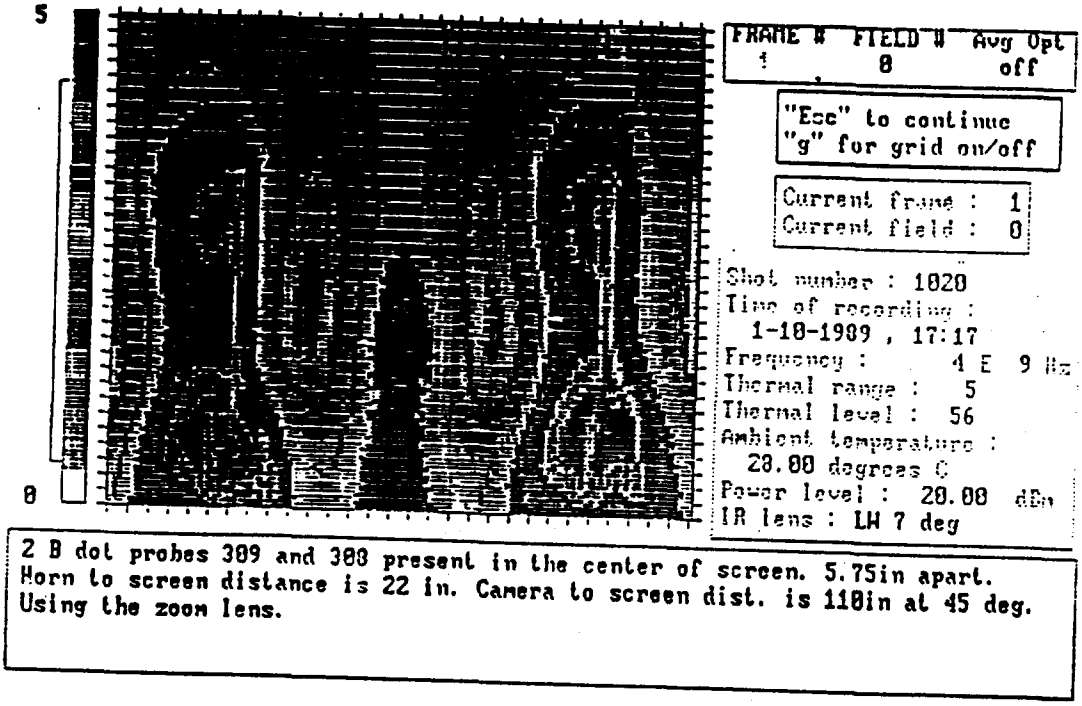


Figure G-9
Shot Number : 1021

Time of Recording : 1-10-1989 , 17:19

Frequency : 5 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

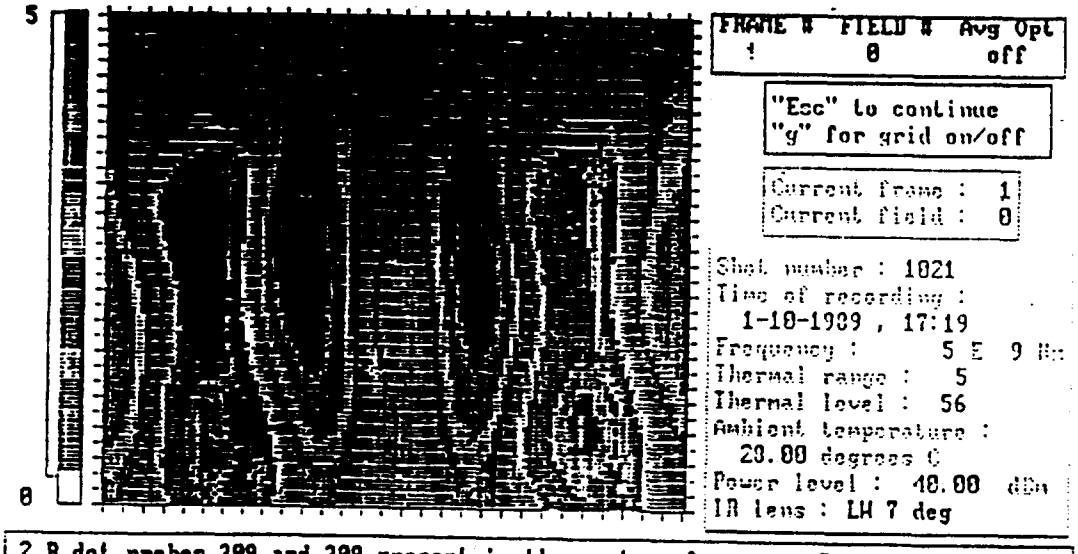
Power Level : 40 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r5g2pc.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 5.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 B dot probes 309 and 308 present in the center of screen. 5.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

Figure G-10

Shot Number : 1022

Time of Recording : 1-10-1989 , 17:21

Frequency : 6 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

Power Level : 30 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r6g2pc.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 5.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

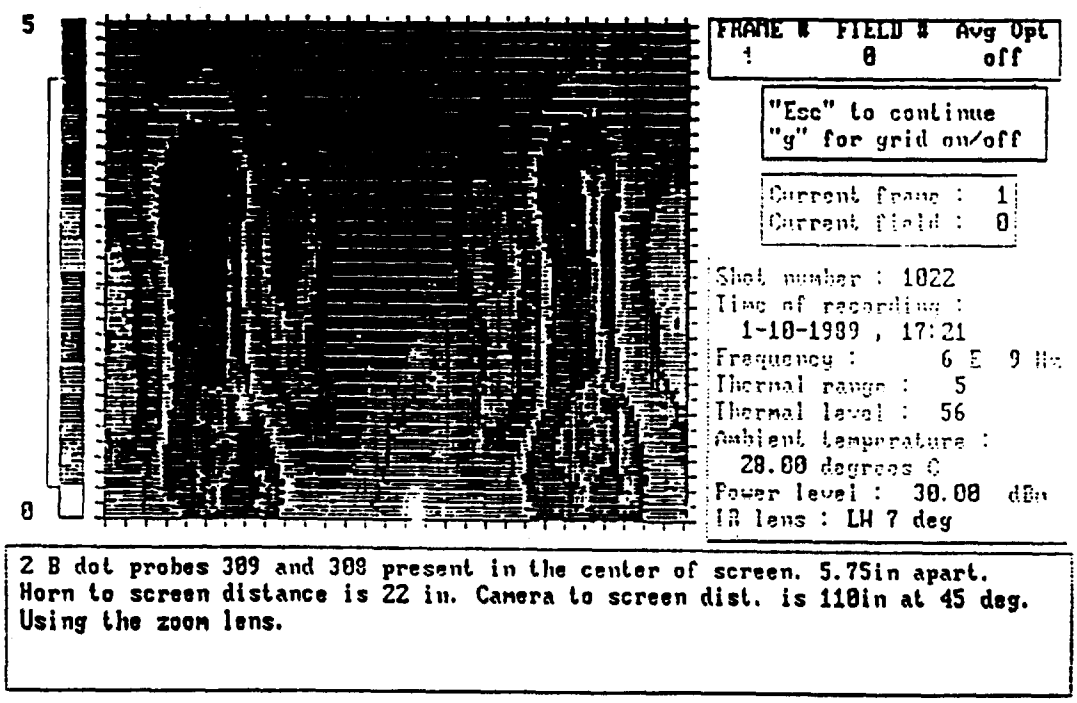


Figure G-11
Shot Number : 1023

Time of Recording : 1-10-1989 , 17:23

Frequency : 7 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

Power Level : 30 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r7g2pc.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 5.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

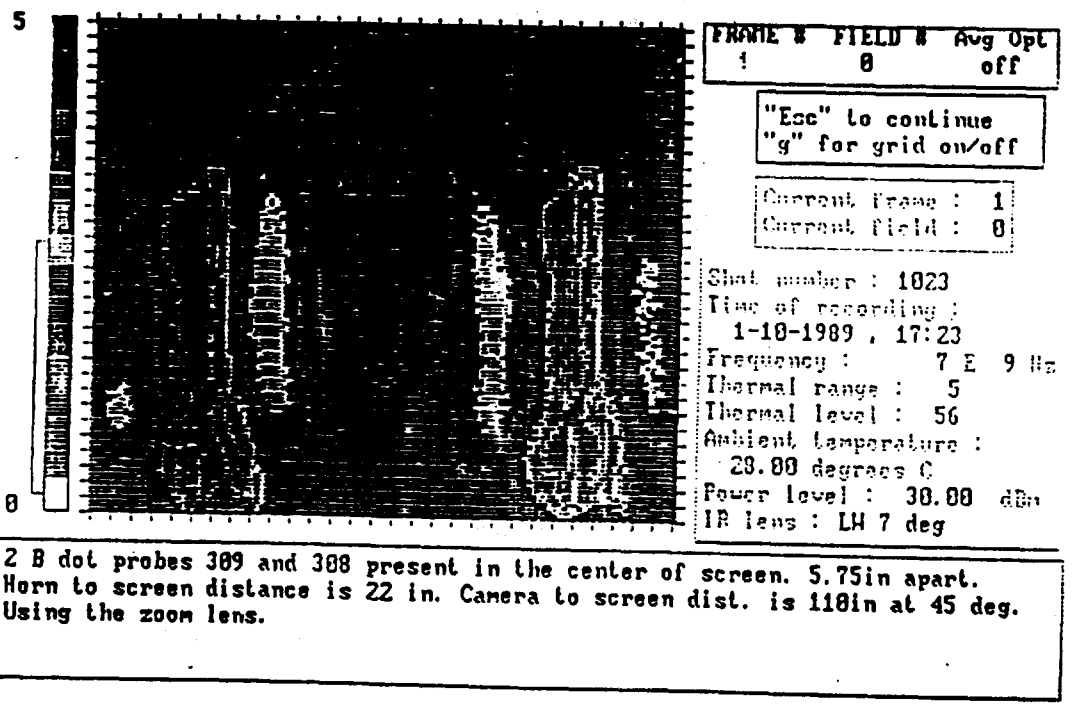


Figure G-12
Shot Number : 1024

Time of Recording : 1-10-1989 , 17:25

Frequency : 8 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

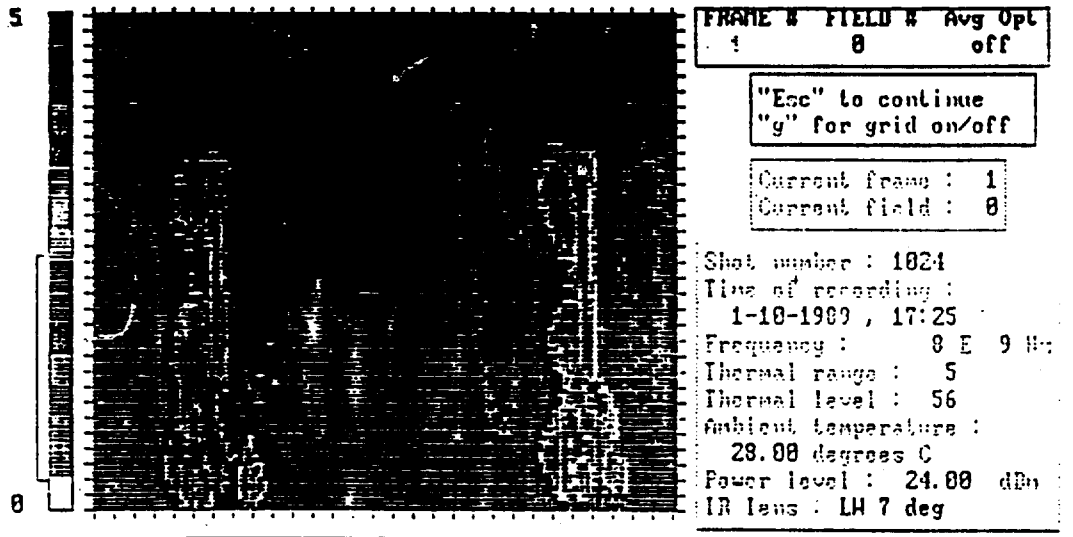
Power Level : 24 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r8g2pc.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 5.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 B dot probes 309 and 308 present in the center of screen. 5.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

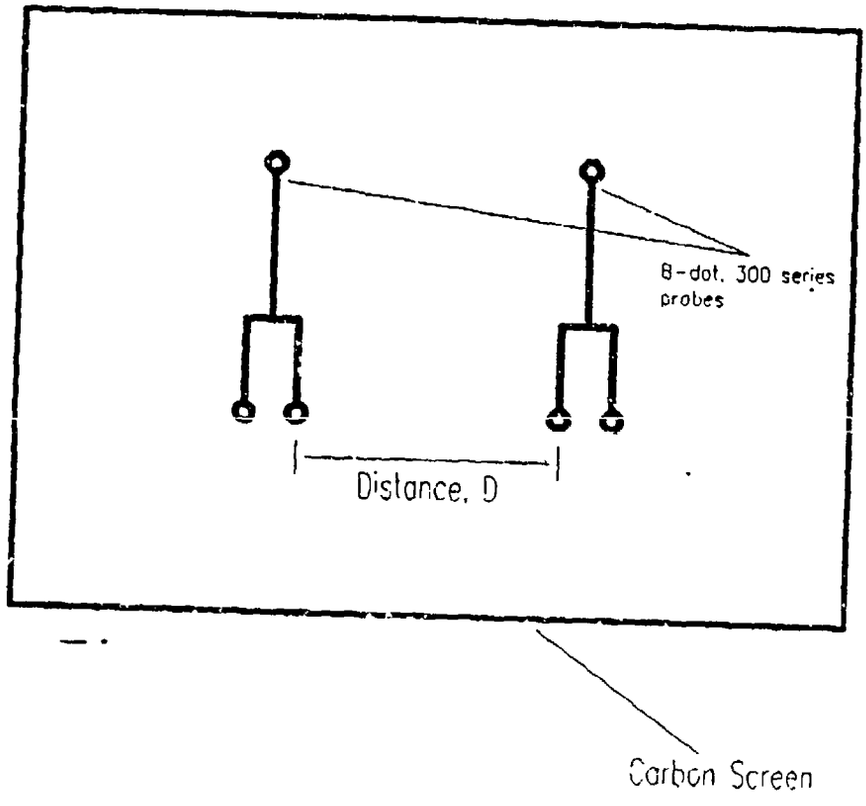
APPENDIX H

DATA: Two Probes

(4.75" separation)

Figure H-1

RADC PROBE STUDY
TWO-PROBE CONFIGURATION
CAMERA VIEW



CONFIGURATION A : Distance D = 4.75 in.

Figure H-2
Shot Number : 2006

Time of Recording : 1-11-1989 , 15:48

Frequency : 1 x 10^9 Hz

Thermal Range : 2

Thermal Level : 52

Ambient Temperature : 28.00°C

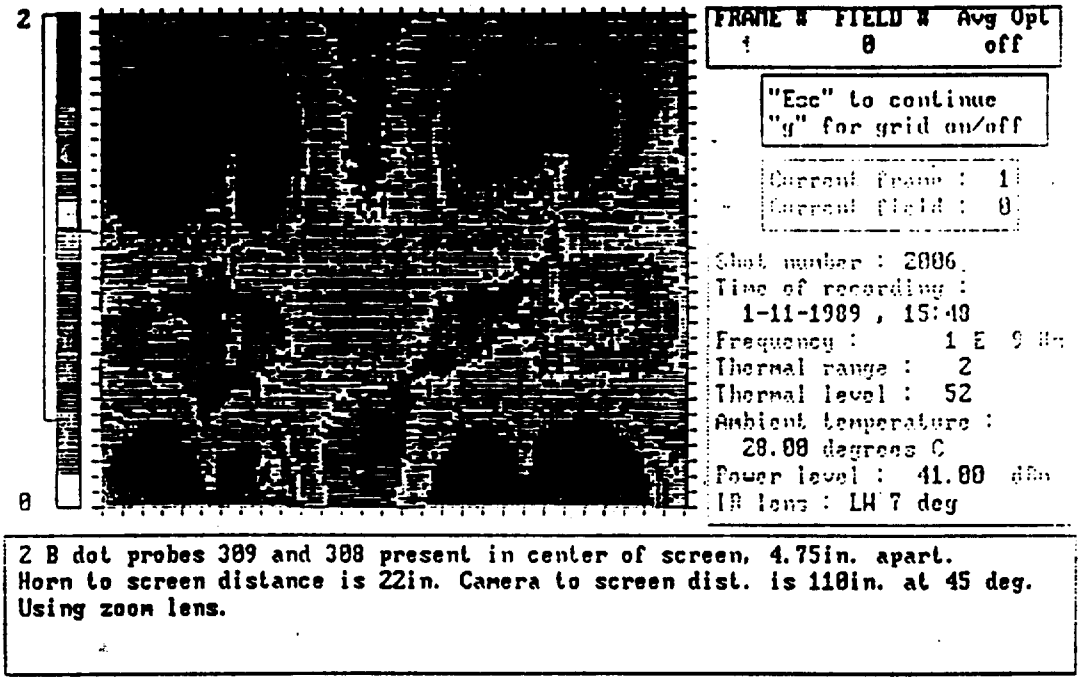
Power Level : 41 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r1g2pa.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 4.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 4.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.

Figure H-3
Shot Number : 2007

Time of Recording : 1-11-1989 , 15:52

Frequency : 1.5 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

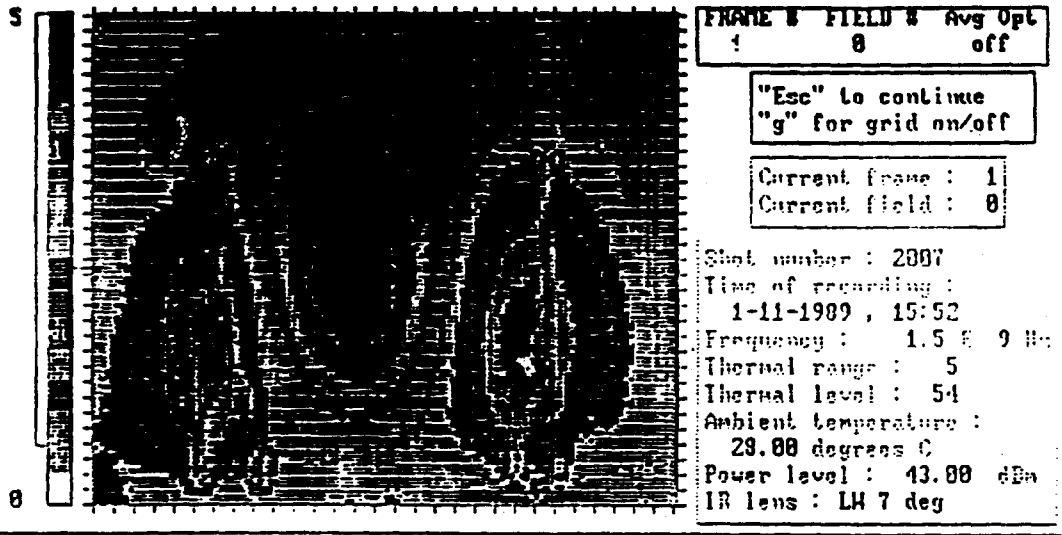
Power Level : 43 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r15g2pa.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 4.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 4.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

Figure H-4
Shot Number : 2008

Time of Recording : 1-11-1989 , 15:54

Frequency : 2 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

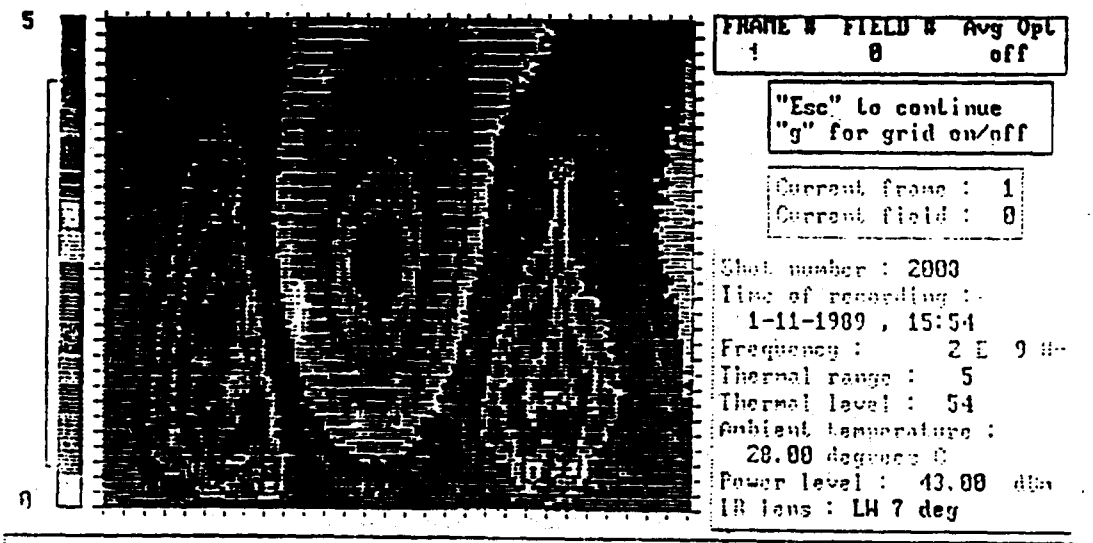
Power Level : 43 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r2g2p2a.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 4.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 4.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.

Figure H-5

Shot Number : 2009

Time of Recording : 1-11-1989 , 16: 6

Frequency : 3 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

Power Level : 40 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r3g2pa.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 4.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.

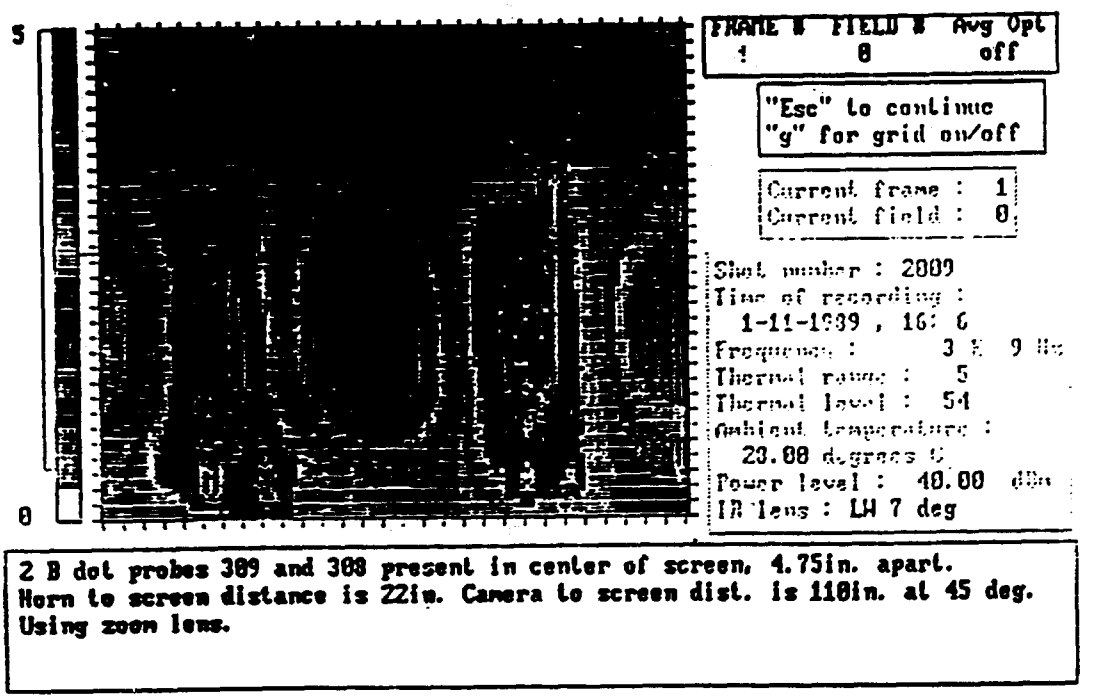


Figure H-6

Shot Number : 2010

Time of Recording : 1-11-1989 , 16:12

Frequency : 4 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

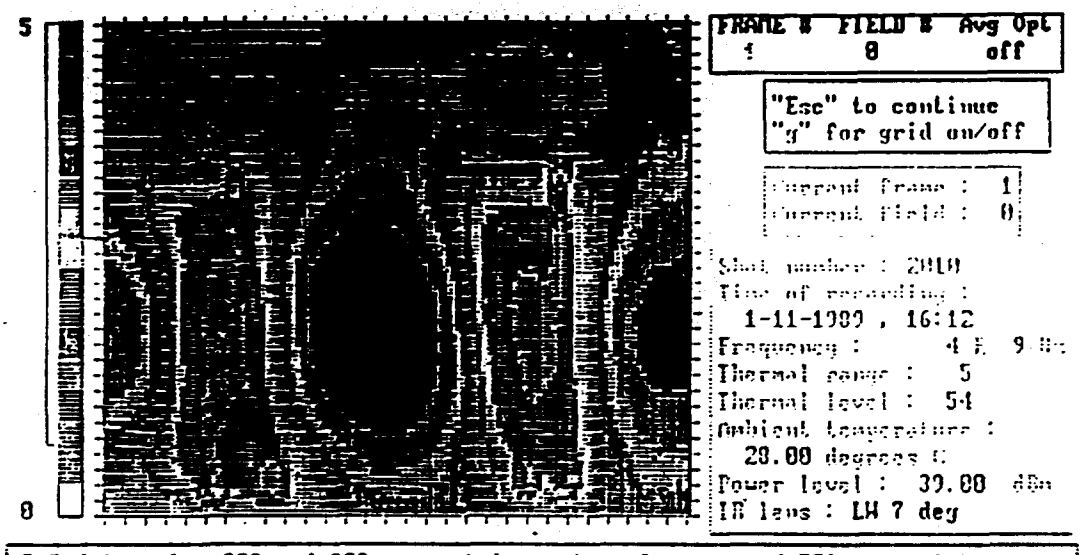
Power Level : 39 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r4g2p2a.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 4.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 4.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.

Figure H-7

Shot Number : 1010

Time of Recording : 1-10-1989 , 16:45

Frequency : 4 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

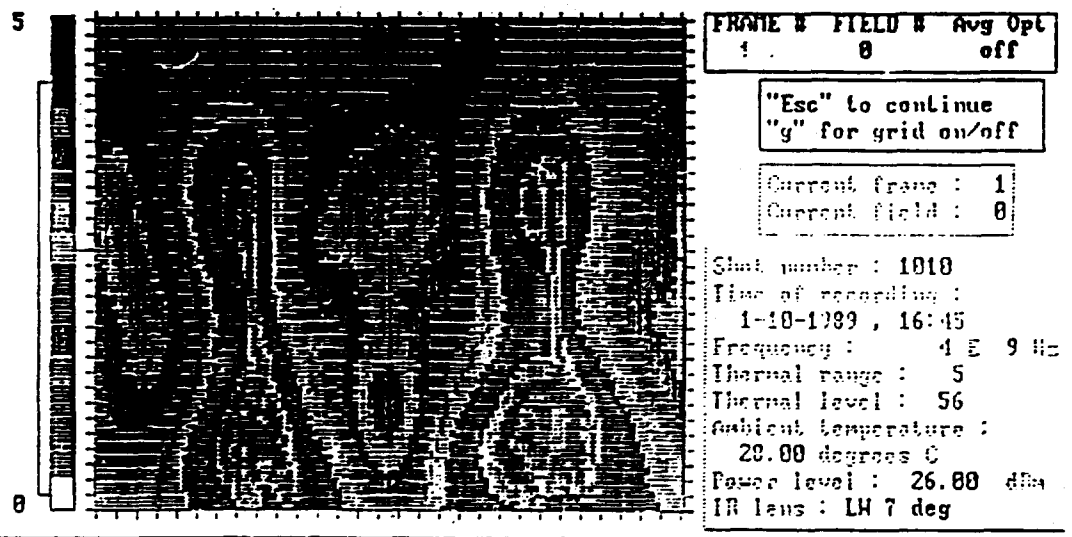
Power Level : 25 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r4g2pa.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 4.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 B dot probes 309 and 308 present in the center of screen. 4.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

Figure H-8
Shot Number : 1011

Time of Recording : 1-10-1989 , 16:49

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

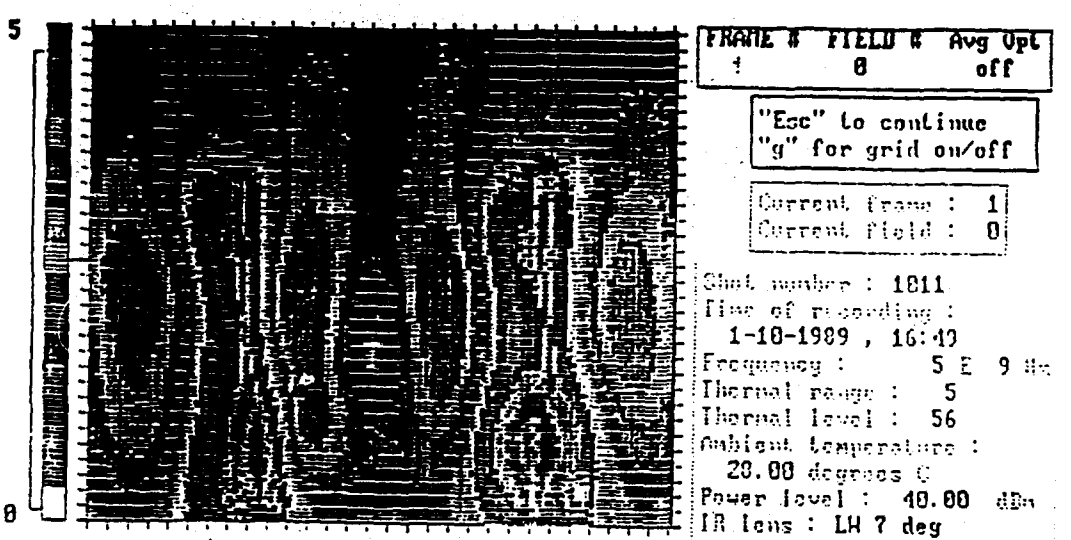
Power Level : 40 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r5g2pa.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 4.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 B dot probes 309 and 308 present in the center of screen. 4.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

Figure H-9

Shot Number : 1012

Time of Recording : 1-10-1989 , 16:51

Frequency : 6 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

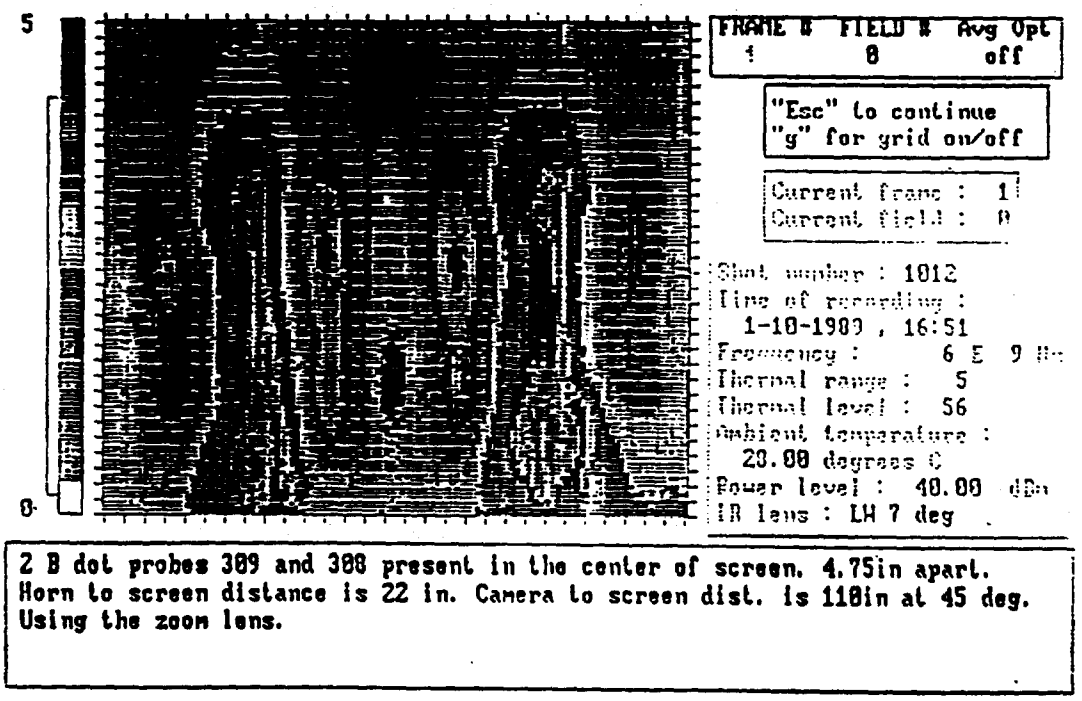
Power Level : 40 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r6g2pa.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 4.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 B dot probes 309 and 308 present in the center of screen. 4.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

Figure H-10
Shot Number : 1013

Time of Recording : 1-10-1989 , 16:53

Frequency : 7 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

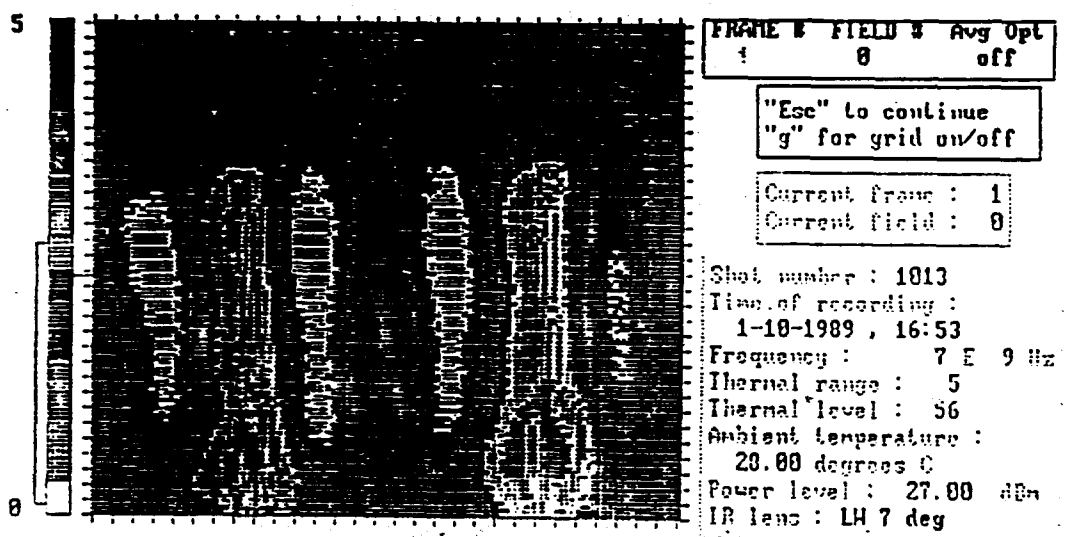
Power Level : 27 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r7g2pa.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 4.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 B dot probes 309 and 308 present in the center of screen. 4.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

Figure H-11
Shot Number : 1014

Time of Recording : 1-10-1989 , 16:55

Frequency : 8 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

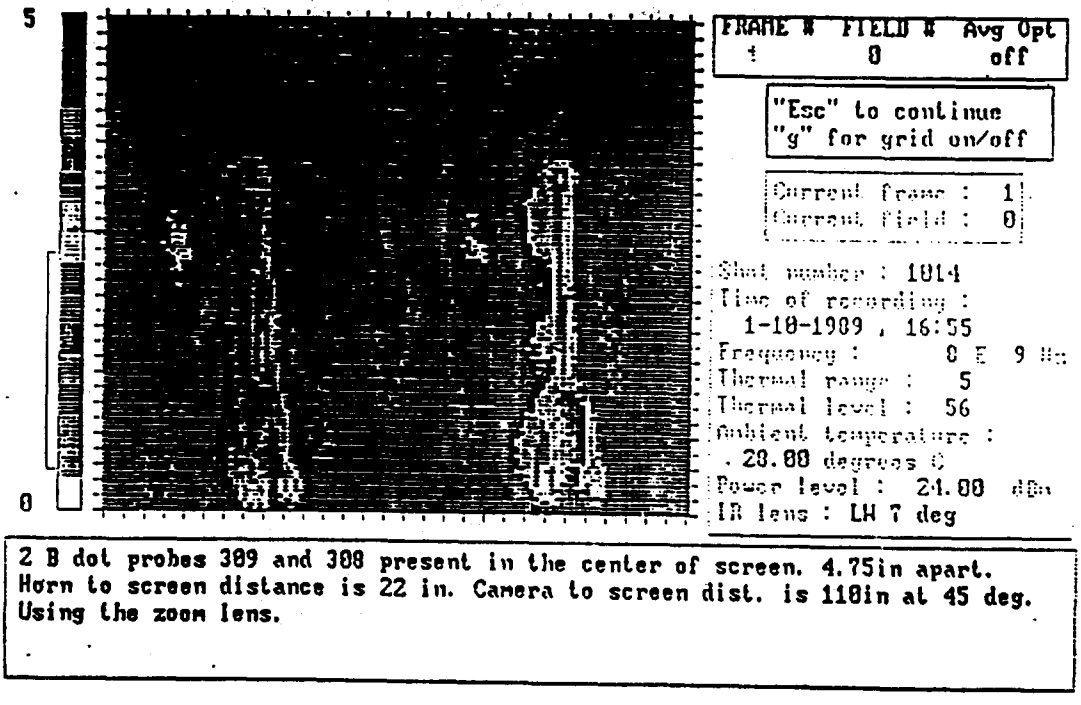
Power Level : 24 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r8g2pa.raw

Comments :

2 8 dot probes 309 and 308 present in the center of screen. 4.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 8 dot probes 309 and 308 present in the center of screen. 4.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

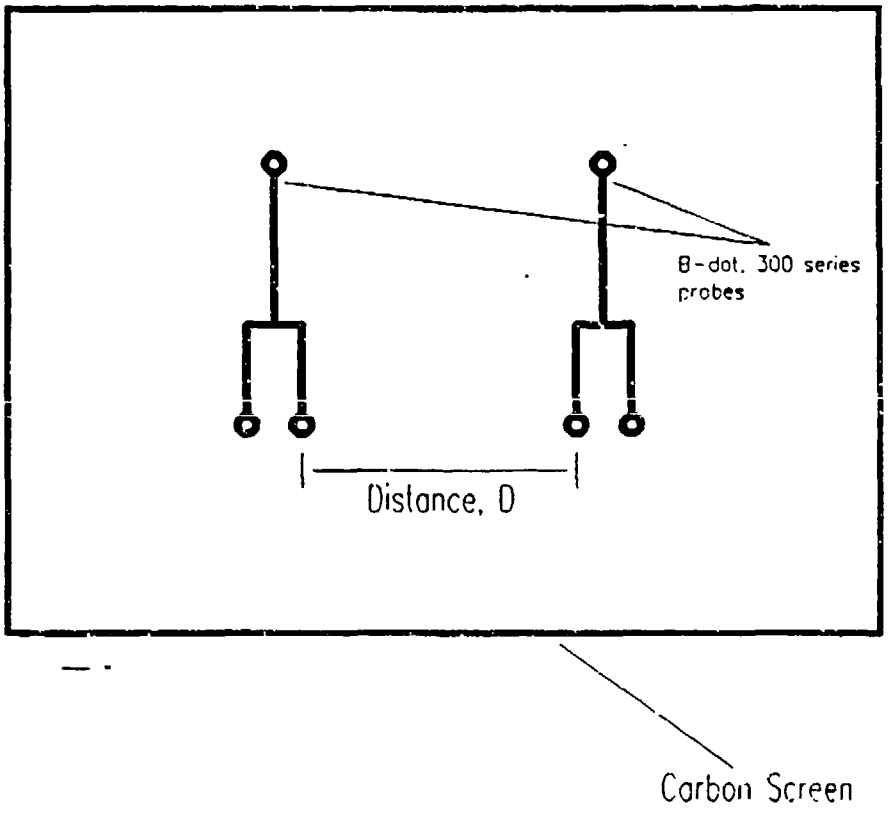
APPENDIX I

DATA: Two Probes

(2.75" separation)

Figure I-1

RADC PROBE STUDY
TWO-PROBE CONFIGURATION
CAMERA VIEW



CONFIGURATION B : Distance D = 2.75 in.

Figure I-2

Shot Number : 2014

Time of Recording : 1-11-1989 , 16:44

Frequency : 1 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

Power Level : 40 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r1g2pb.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 2.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

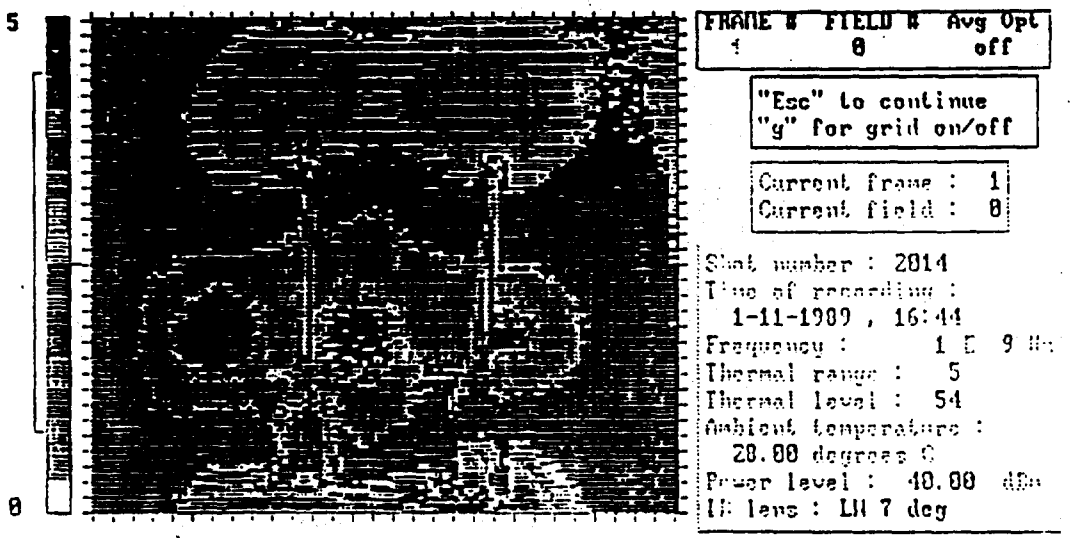


Figure I-3
Shot Number : 2015

Time of Recording : 1-11-1989 , 16:46

Frequency : 1.5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 54

Ambient Temperature : 28.00°C

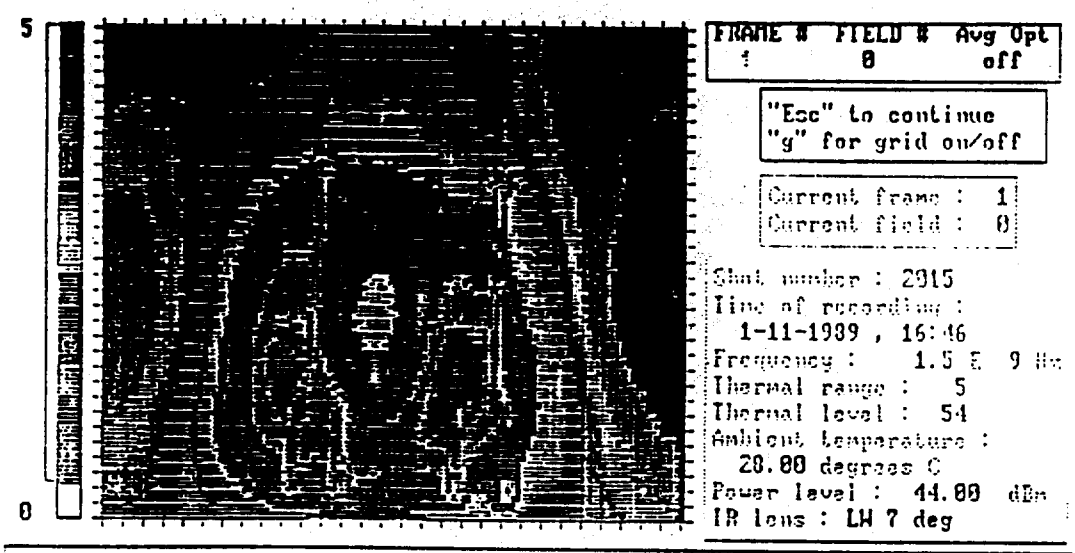
Power Level : 44 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r15g2pb.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 2.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 2.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.

Figure I-4
Shot Number : 2013

Time of Recording : 1-11-1989 , 16:29

Frequency : 2 x 10⁹ Hz

Thermal Range : 2

Thermal Level : 54

Ambient Temperature : 28.00°C

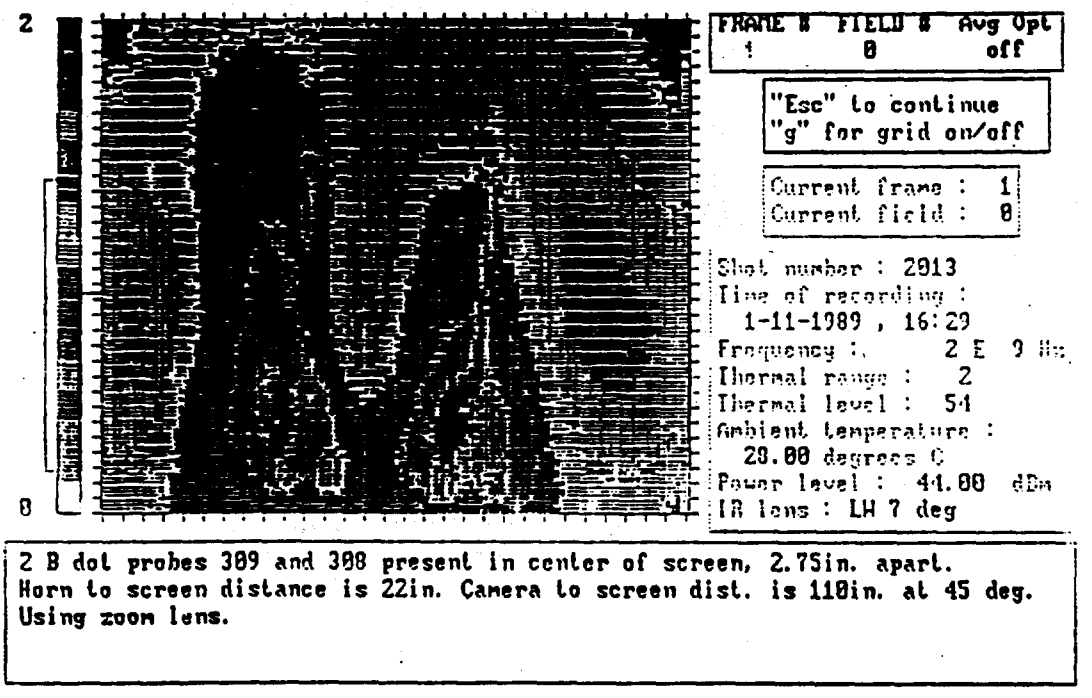
Power Level : 44 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r2g2pb.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 2.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 2.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.

Figure I-5

Shot Number : 2012

Time of Recording : 1-11-1989 , 16:26

Frequency : 3 x 10^9 Hz

Thermal Range : 2

Thermal Level : 54

Ambient Temperature : 23.00°C

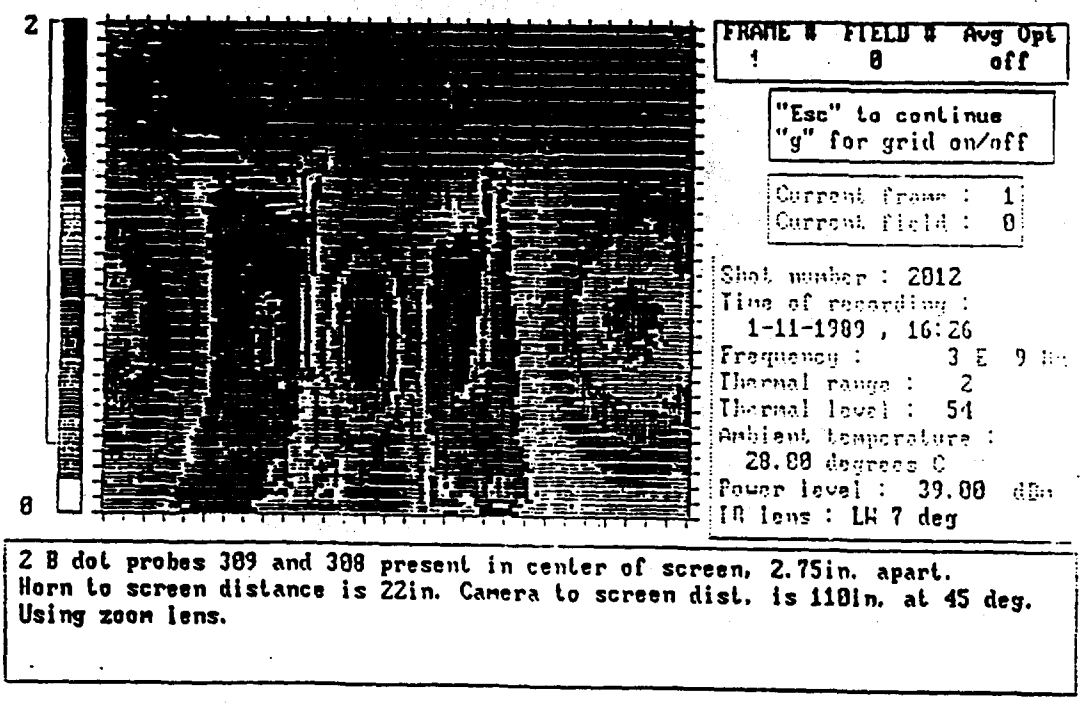
Power Level : 39 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r3g2pb.raw

Comments :

2 B dot probes 309 and 308 present in center of screen, 2.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 2.75in. apart.
Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg.
Using zoom lens.

Figure I-6

Shot Number : 2011

Time of Recording : 1-11-1989 , 16:23

Frequency : 4 x 10^9 Hz

Thermal Range : 2

Thermal Level : 54

Ambient Temperature : 28.00°C

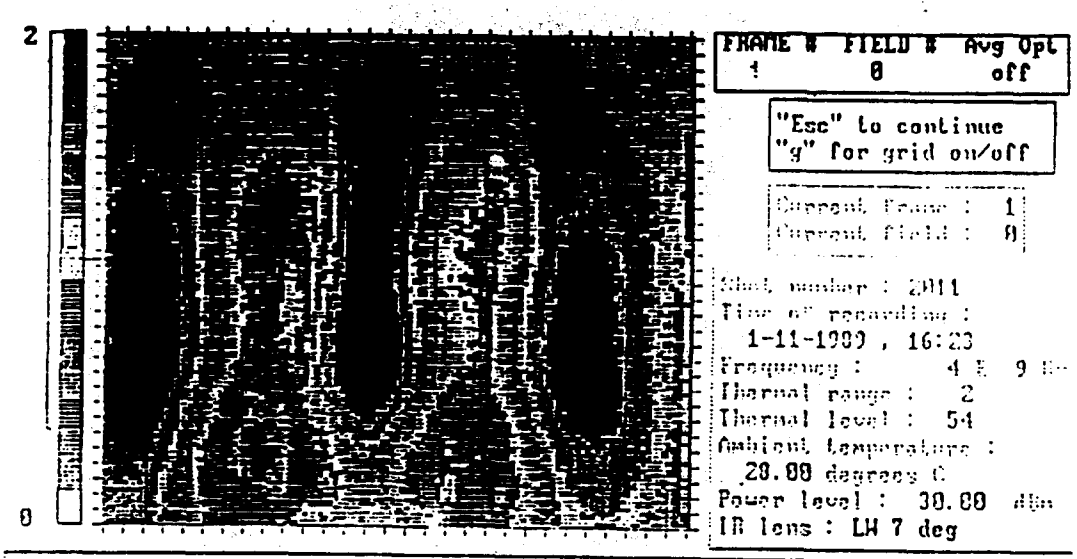
Power Level : 30 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r4g2p2b.raw

Comments :

2 B dot probes 309 and 303 present in center of screen, 2.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.



2 B dot probes 309 and 308 present in center of screen, 2.75in. apart. Horn to screen distance is 22in. Camera to screen dist. is 110in. at 45 deg. Using zoom lens.

Figure I-7
Shot Number : 1015

Time of Recording : 1-10-1989 , 17: 0

Frequency : 4 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

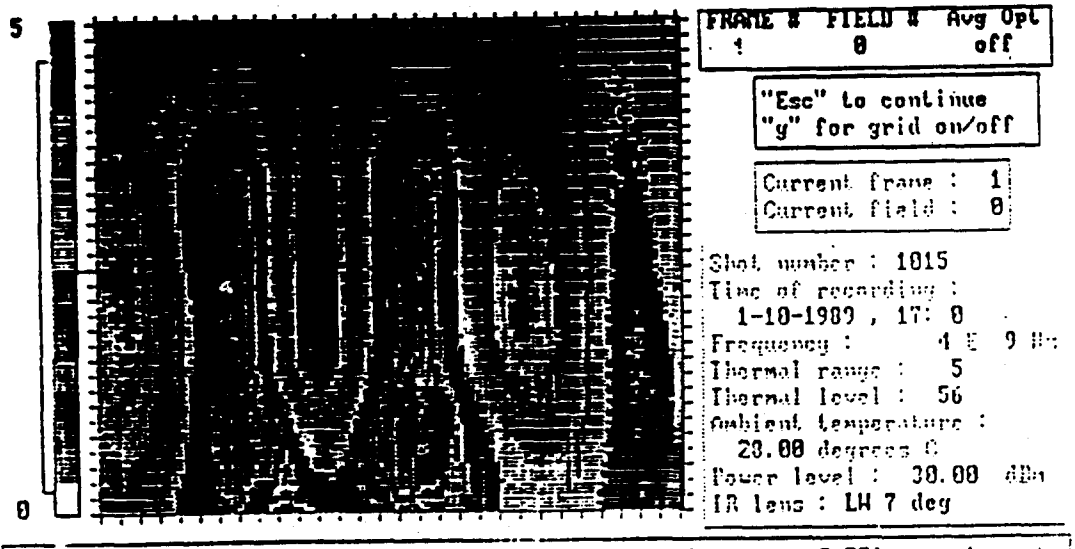
Power Level : 30 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r4g2pb.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 2.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 B dot probes 309 and 308 present in the center of screen. 2.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

Figure I-8
Shot Number : 1016

Time of Recording : 1-10-1989 , 17: 4

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

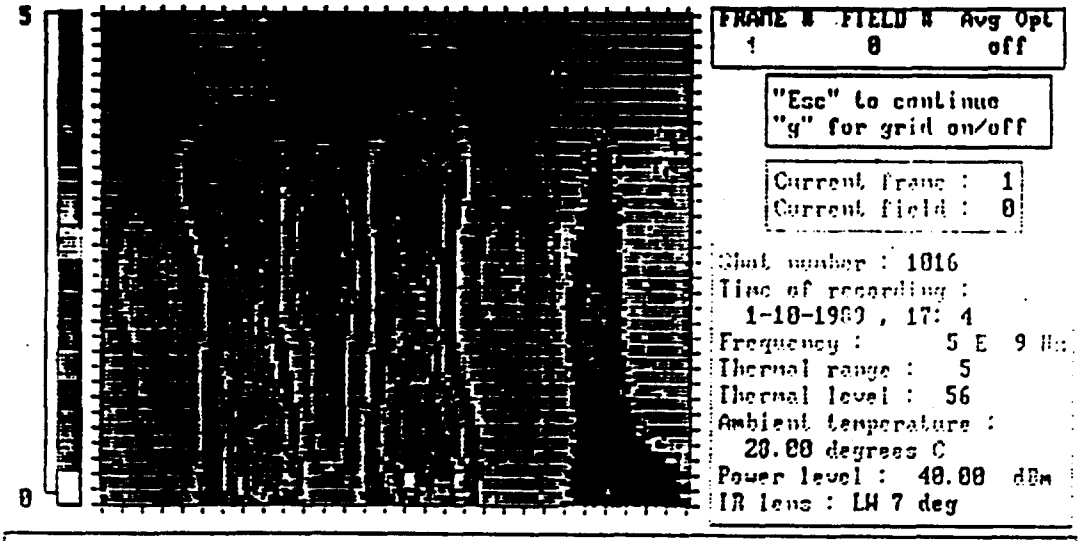
Power Level : 40 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : r5g2pb.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 2.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 B dot probes 309 and 308 present in the center of screen. 2.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

Figure I-9

Shot Number : 1017

Time of Recording : 1-10-1989 , 17: 6

Frequency : 6 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

Power Level : 30 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r6g2pb.raw

Comments :

2 B dot probes 309 and 308 present in the center of screen. 2.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

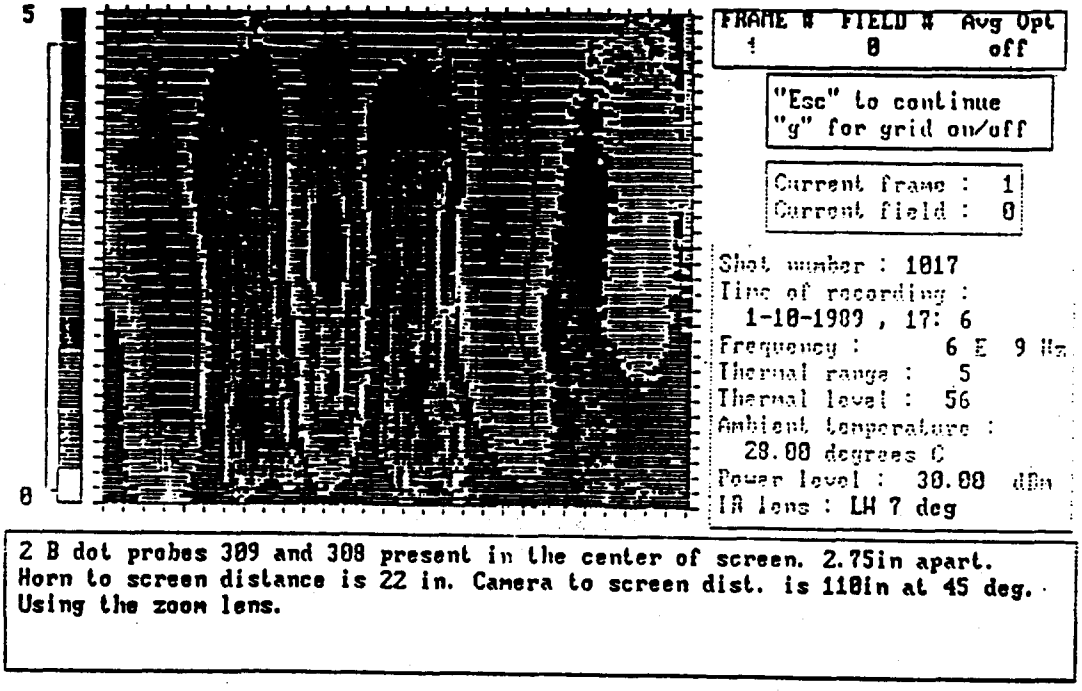


Figure I-10
Shot Number : 1013

Time of Recording : 1-10-1989 , 17: 9

Frequency : 7 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

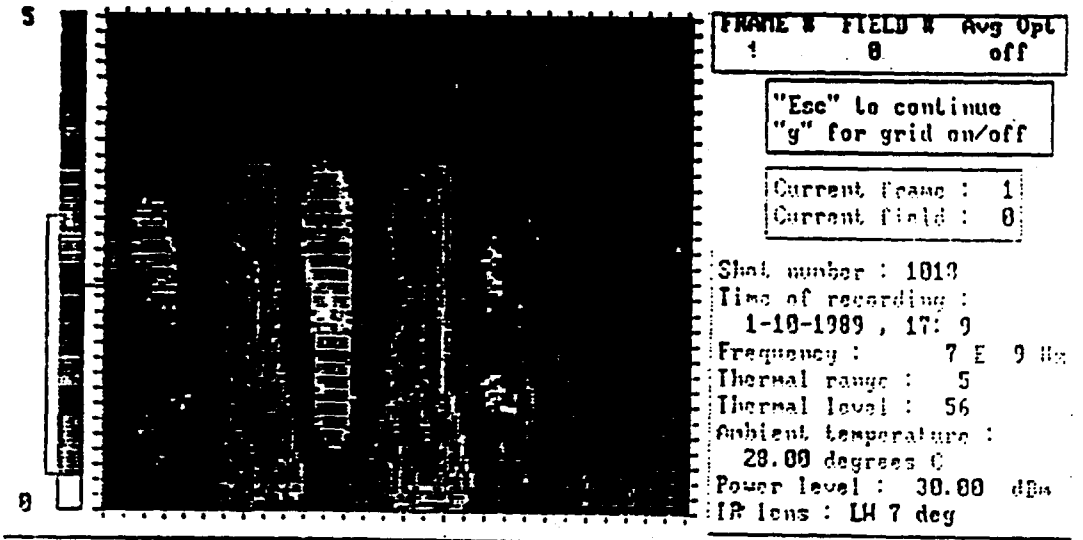
Power Level : 30 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r7g2pb.raw

Comments :

2 B dot probes 309 and 303 present in the center of screen. 2.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 B dot probes 309 and 309 present in the center of screen. 2.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

Figure I-11

Shot Number : 1019

Time of Recording : 1-10-1989 , 17:11

Frequency : 8 x 10^9 Hz

Thermal Range : 5

Thermal Level : 56

Ambient Temperature : 28.00°C

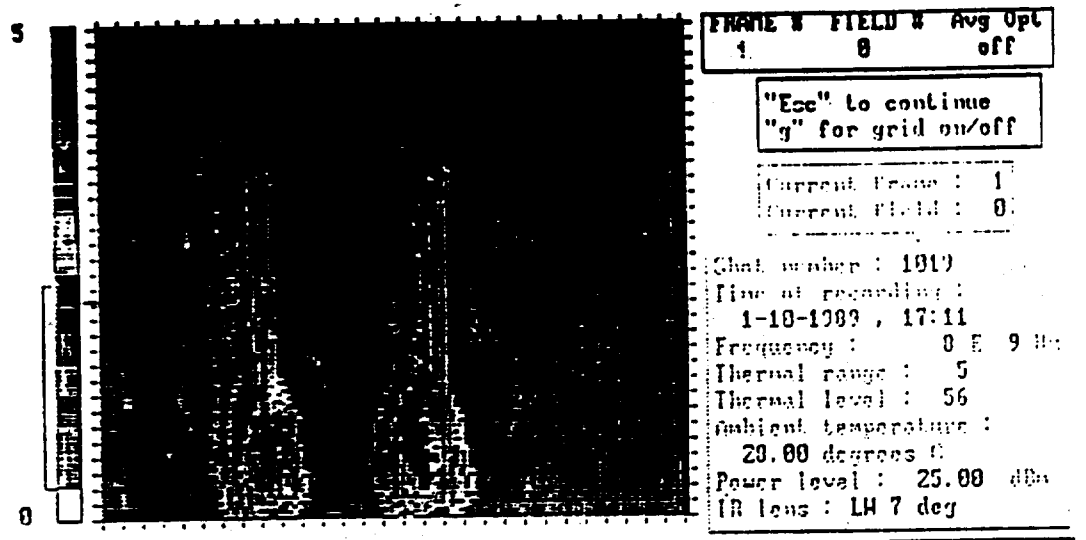
Power Level : 25 E 0

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r8g2pb.raw

Comments :

2 8 dot probes 309 and 308 present in the center of screen. 2.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.



2 8 dot probes 309 and 308 present in the center of screen. 2.75in apart. Horn to screen distance is 22 in. Camera to screen dist. is 110in at 45 deg. Using the zoom lens.

APPENDIX J

DATA: Two Probes

(1 GHz)

Figure J-1

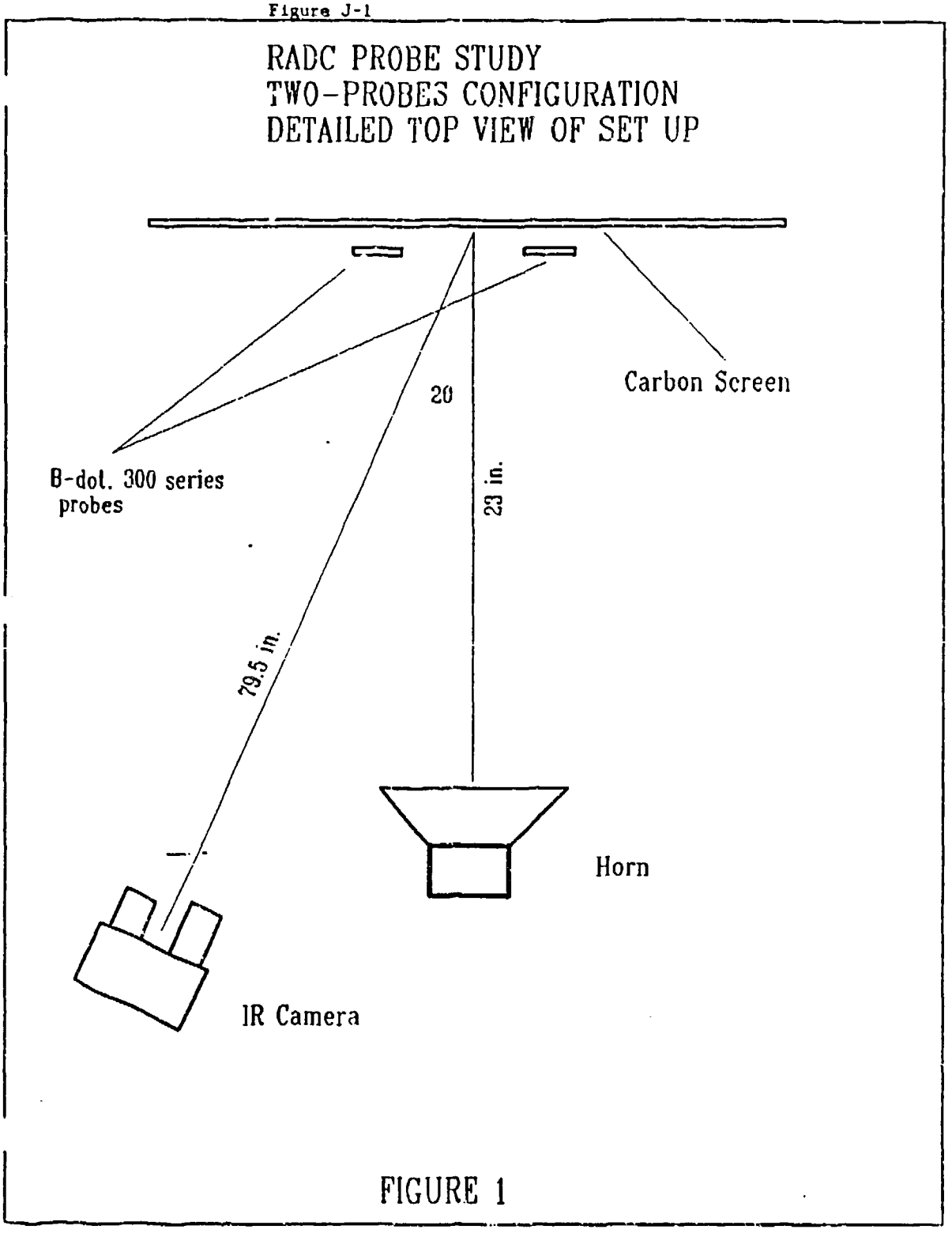


FIGURE 1

Figure J-2

RADC PROBE STUDY
TWO-PROBE CONFIGURATION
CAMERA VIEW

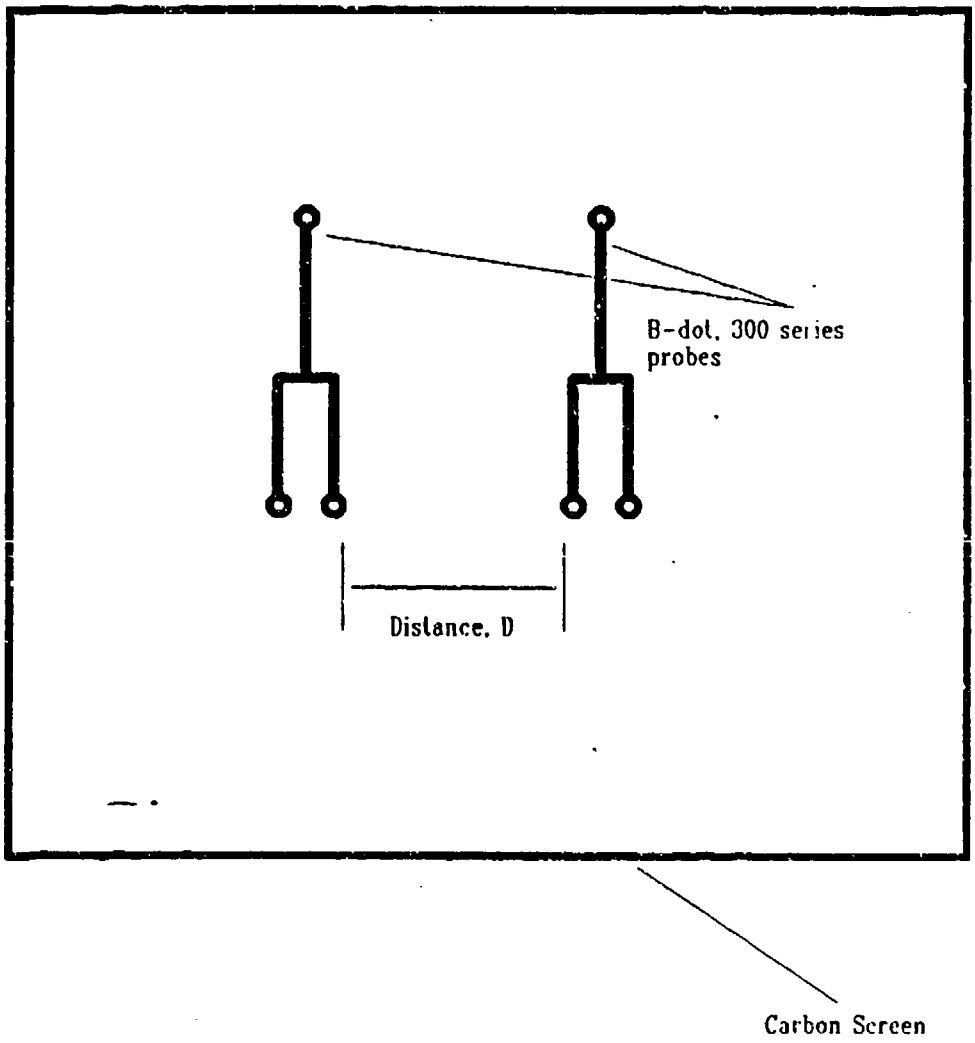


FIGURE 2.

Figure J-3
Shot Number : 3000

Time of Recording : 4- 7-1989 , 8:34

Frequency : 1 x 10^9 Hz

Thermal Range : 5

Thermal Level : 65

Ambient Temperature : 27.00°C

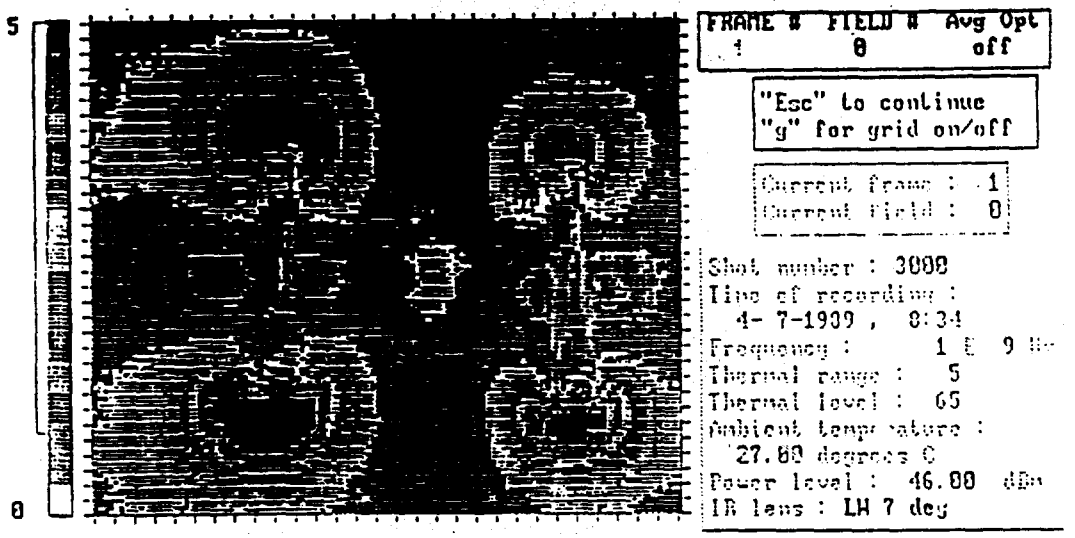
Power Level : 46 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P1GD10.RAW

Comments :

Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 10 cm. Camera angle is approximately 20 degrees.
E-polarized.



Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 10 cm. Camera angle is approximately 20 degrees.
E-polarized.

Figure J-4
Shot Number : 3001

Time of Recording : 4- 7-1989 , 8:42

Frequency : 1 x 10^9 Hz

Thermal Range : 5

Thermal Level : 63

Ambient Temperature : 27.00°C

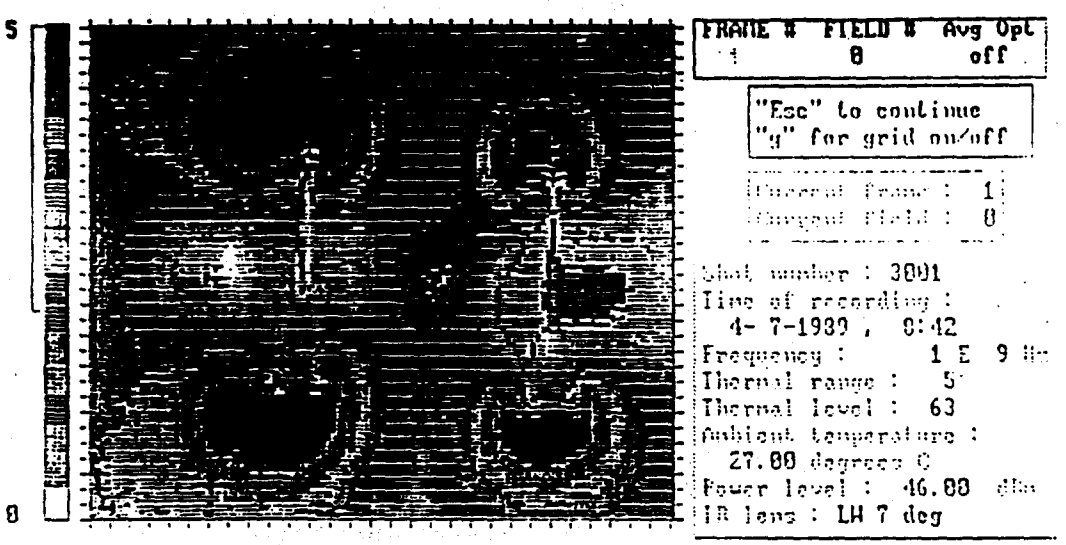
Power Level : 46 E 0

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P1G09.RAW

Comments :

Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 9 cm. Camera angle is approximately 20 degrees.
E-polarized.



**Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 9 cm. Camera angle is approximately 20 degrees.
E-polarized.**

Figure J-5
Shot Number : 3002

Time of Recording : 4- 7-1989 , 8:47

Frequency : 1 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 64

Ambient Temperature : 27.00°C

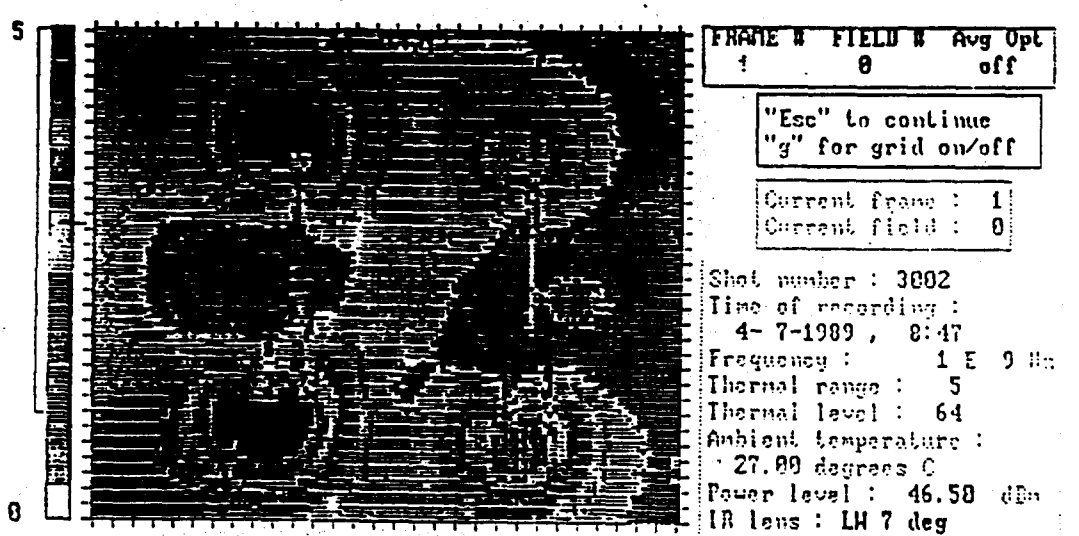
Power Level : 465 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P1GD8.RAW

Comments :

Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 8 cm. Camera angle is approximately 20 degrees.
E-polarized.



**Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 8 cm. Camera angle is approximately 20 degrees.
E-polarized.**

Figure J-6

Shot Number : 3003

Time of Recording : 4- 7-1989 , 8:55

Frequency : 1 x 10^9 Hz

Thermal Range : 5

Thermal Level : 64

Ambient Temperature : 27.00°C

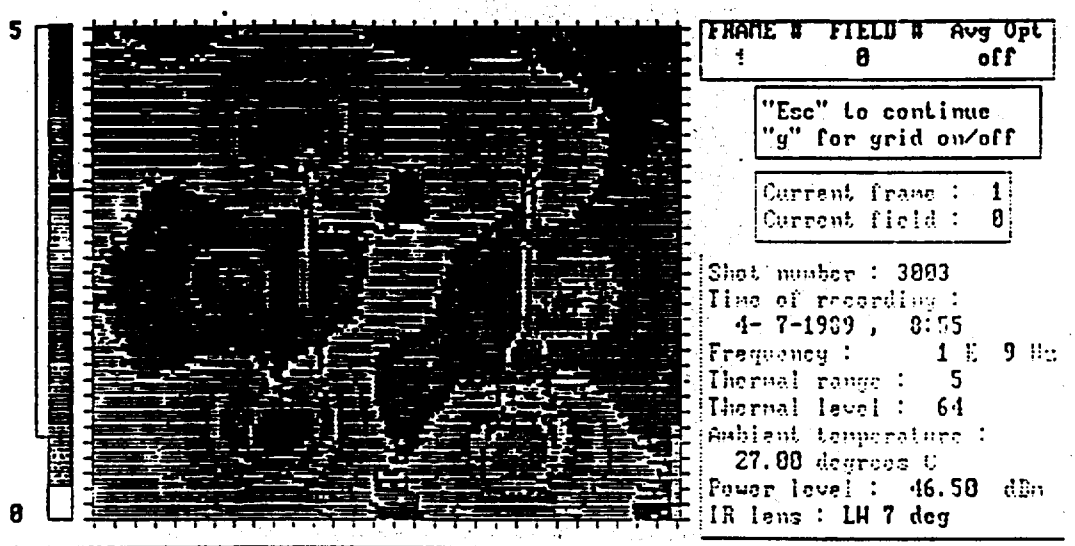
Power Level : 465 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P1GD7.RAW

Comments :

Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 7 cm. Camera angle is approximately 20 degrees.
E-polarized.



**Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 7 cm. Camera angle is approximately 20 degrees.
E-polarized.**

Figure J-7

Shot Number : 3005

Time of Recording : 4- 7-1989 , 9: 0

Frequency : 1 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 63

Ambient Temperature : 27.00°C

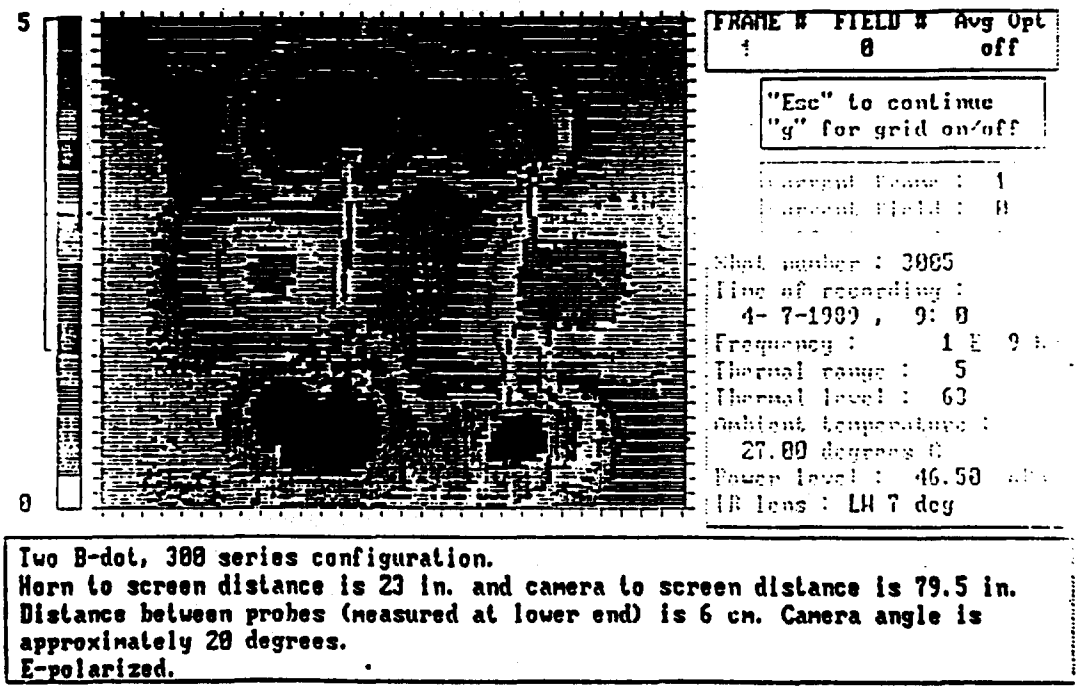
Power Level : 465 E -1

IR Camera Lens : Long Wave, f/1.9, 7°

Name of Stored Data File : R2P1GD6.RAW

Comments :

Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 6 cm. Camera angle is approximately 20 degrees.
E-polarized.



**Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 6 cm. Camera angle is approximately 20 degrees.
E-polarized.**

Figure J-8

Shot Number : 3007

Time of Recording : 4- 7-1989 , 9:11

Frequency : 1 x 10⁹ Hz

Thermal Range : 5

Thermal Level : 64

Ambient Temperature : 27.00°C

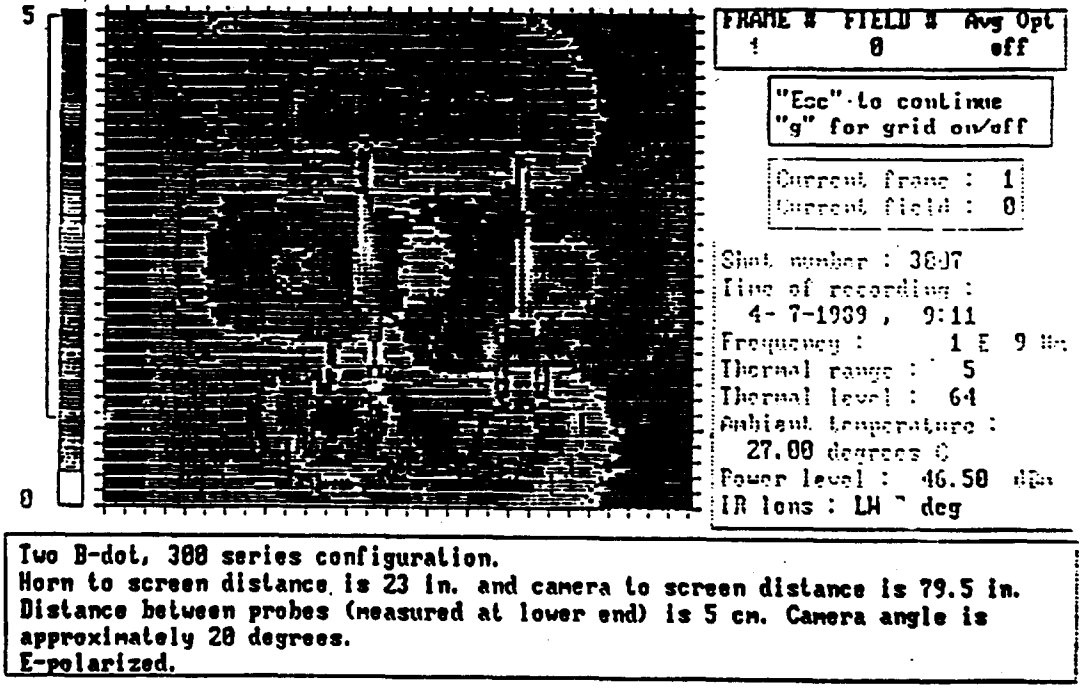
Power Level : 465 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P1GD5.RAW .

Comments :

Two S-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 5 cm. Camera angle is approximately 20 degrees.
E-polarized.



**Two S-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 5 cm. Camera angle is approximately 20 degrees.
E-polarized.**

Figure J-9

Shot Number : 3010

Time of Recording : 4- 7-1989 , 9:18

Frequency : 1 x 10^9 Hz

Thermal Range : 5

Thermal Level : 62

Ambient Temperature : 27.00°C

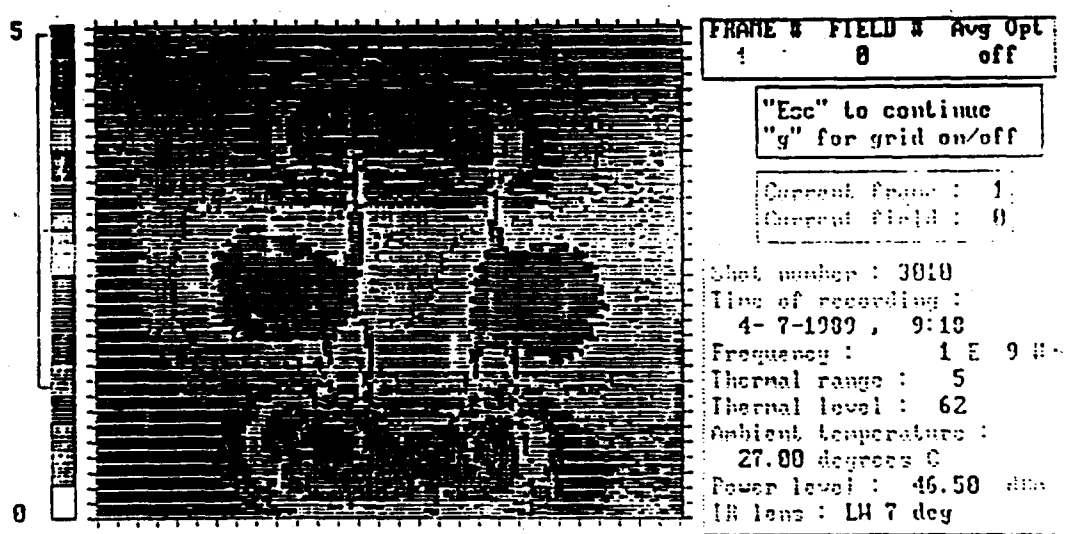
Power Level : 465 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P1GD4.RAW .

Comments :

Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 4 cm. Camera angle is approximately 20 degrees.
E-polarized.



**Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 4 cm. Camera angle is approximately 20 degrees.
E-polarized.**

Figure J-10
Shot Number : 3013

Time of Recording : 4- 7-1989 , 9:28

Frequency : 1 x 10^9 Hz

Thermal Range : 5

Thermal Level : 64

Ambient Temperature : 27.00°C

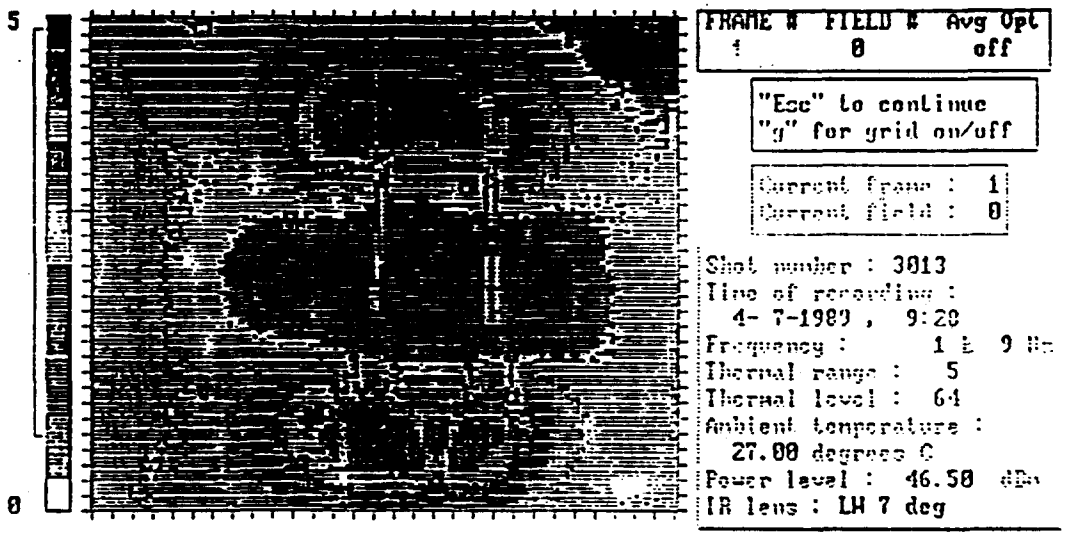
Power Level : 465 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P1GD3.RAW

Comments :

Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 3 cm. Camera angle is approximately 20 degrees.
E-polarized.



**Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 3 cm. Camera angle is approximately 20 degrees.
E-polarized.**

Figure J-11
Shot Number : 3015

Time of Recording : 4- 7-1989 , 9:34

Frequency : 1 x 10^9 Hz

Thermal Range : 5

Thermal Level : 64

Ambient Temperature : 27.00°C

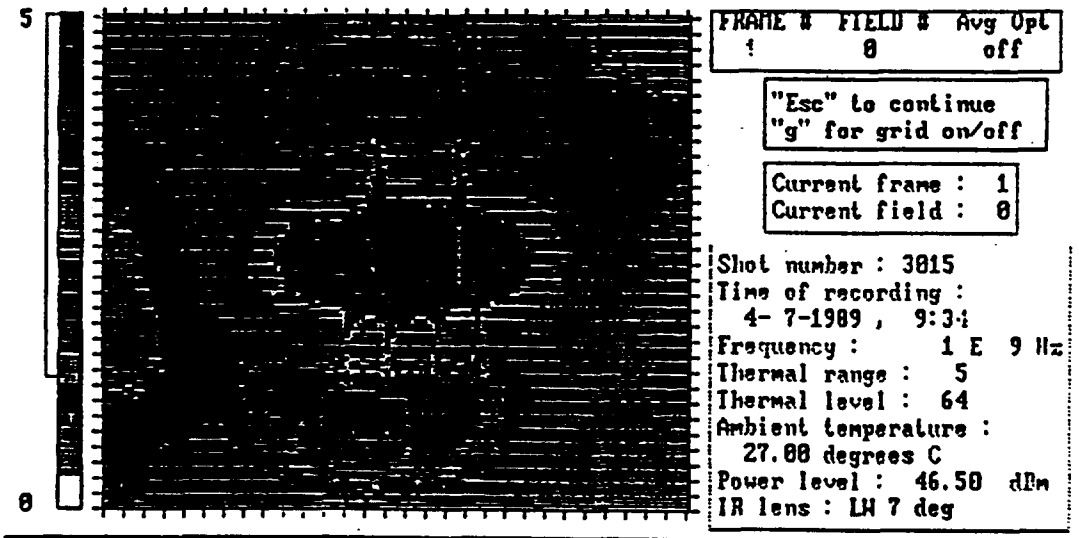
Power Level : 465 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P1GD2.RAW

Comments :

Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 2 cm. Camera angle is
approximately 20 degrees.
E-polarized.



Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 2 cm. Camera angle is
approximately 20 degrees.
E-polarized.

Figure J-12

Shot Number : 3017

Time of Recording : 4- 7-1989 , 9:43

Frequency : 1 x 10^9 Hz

Thermal Range : 5

Thermal Level : 65

Ambient Temperature : 27.00°C

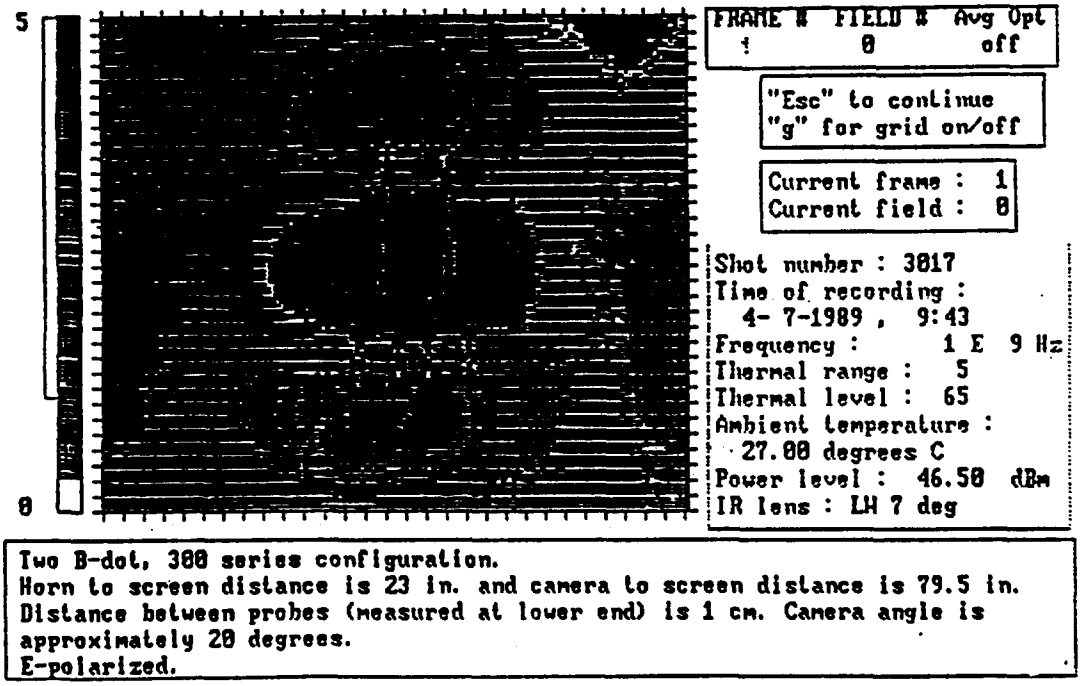
Power Level : 465 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P1GD1.RAW

Comments :

Two B-dot, 300 series configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 1 cm. Camera angle is approximately 20 degrees.
E-polarized.



APPENDIX K

DATA: Two Probes

(5 GHz)

Figure K-1

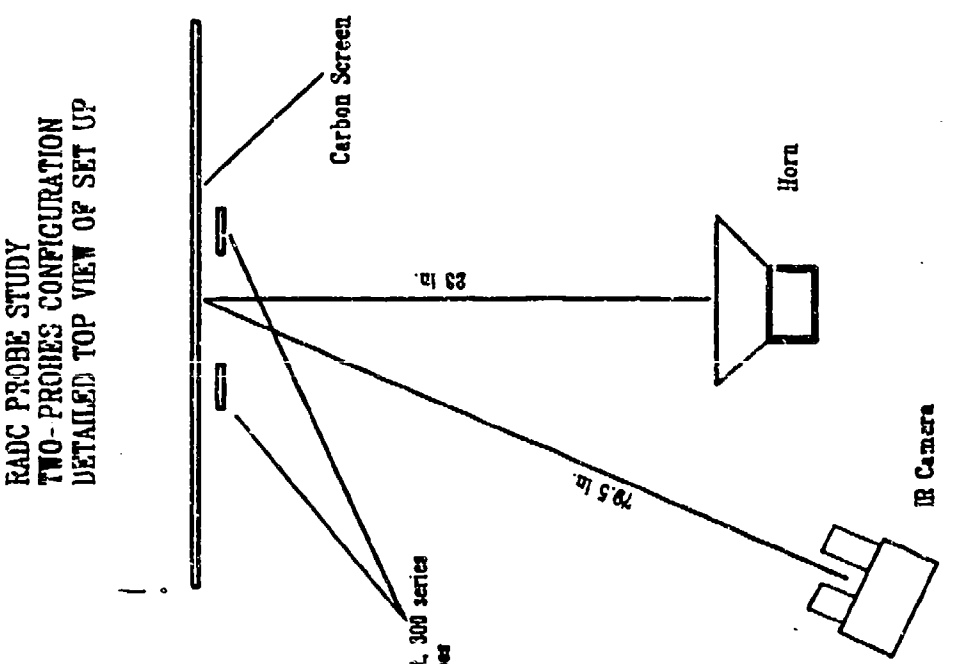


FIGURE 1

Figure K-2

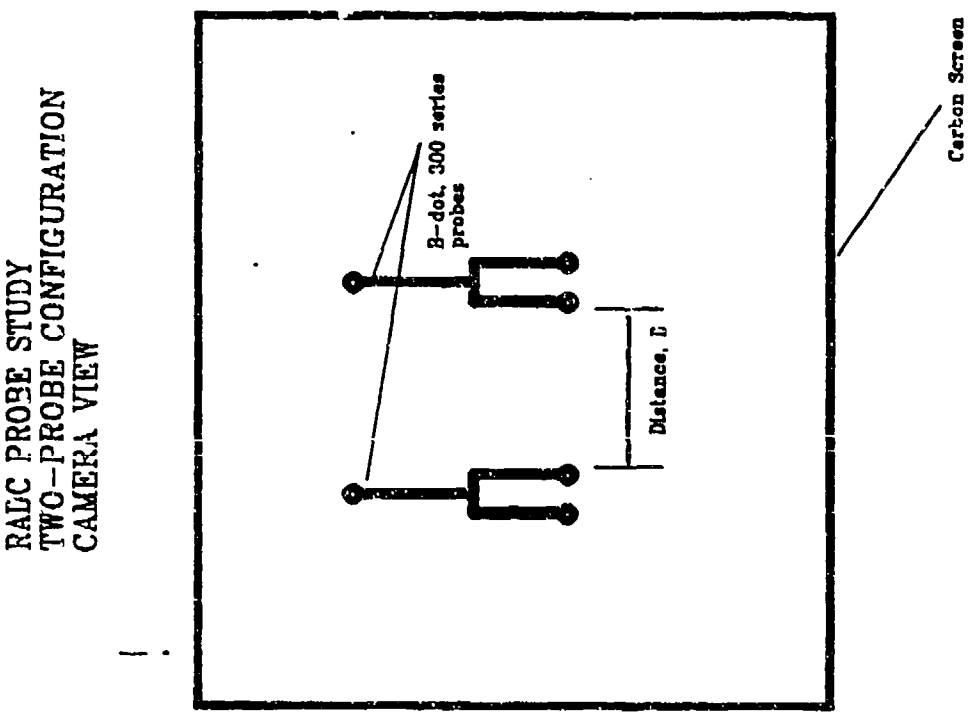


FIGURE 2

Figure K-3

Shot Number : 11

Time of Recording : 4- 6-1989 , 13:52

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 65

Ambient Temperature : 27.00°C

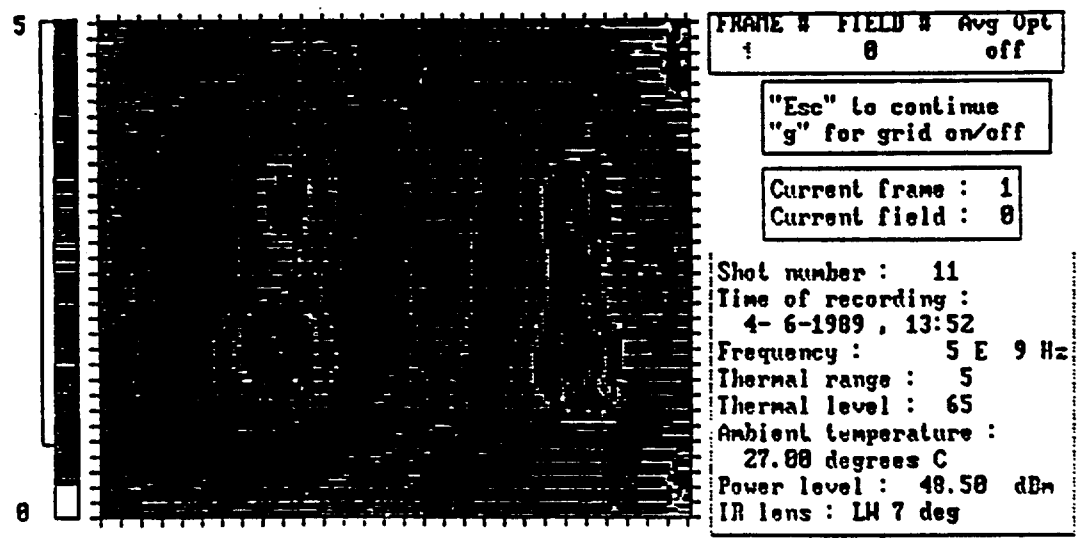
Power Level : 485 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P5GD10.RAW

Comments :

Two 8-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 10 cm. Camera angle is approximately 20 degrees.
E-Polarized.



**Two 8-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 10 cm. Camera angle is approximately 20 degrees.
E-Polarized.**

FIgure K-4

Shot Number : 10

Time of Recording : 4- 6-1989 , 13:50

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 65

Ambient Temperature : 27.00°C

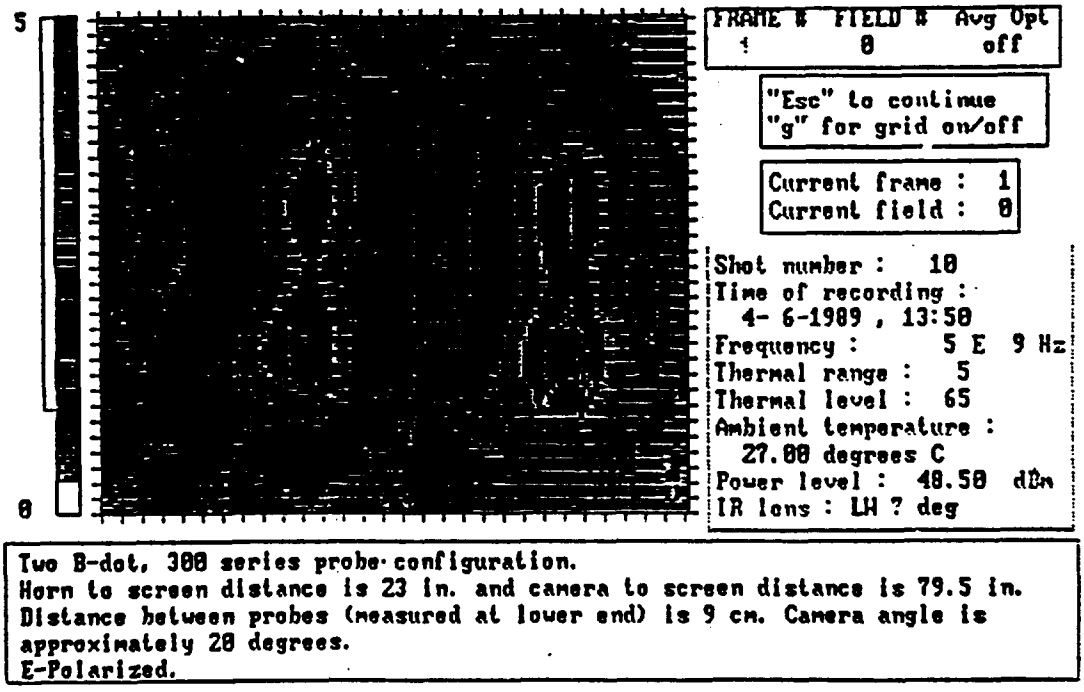
Power Level : 485 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P5GD9.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 9 cm. Camera angle is approximately 20 degrees.
E-Polarized.



Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 9 cm. Camera angle is approximately 20 degrees.
E-Polarized.

Figure K-5
Shot Number : 9

Time of Recording : 4- 6-1989 , 13:47

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 66

Ambient Temperature : 27.00°C

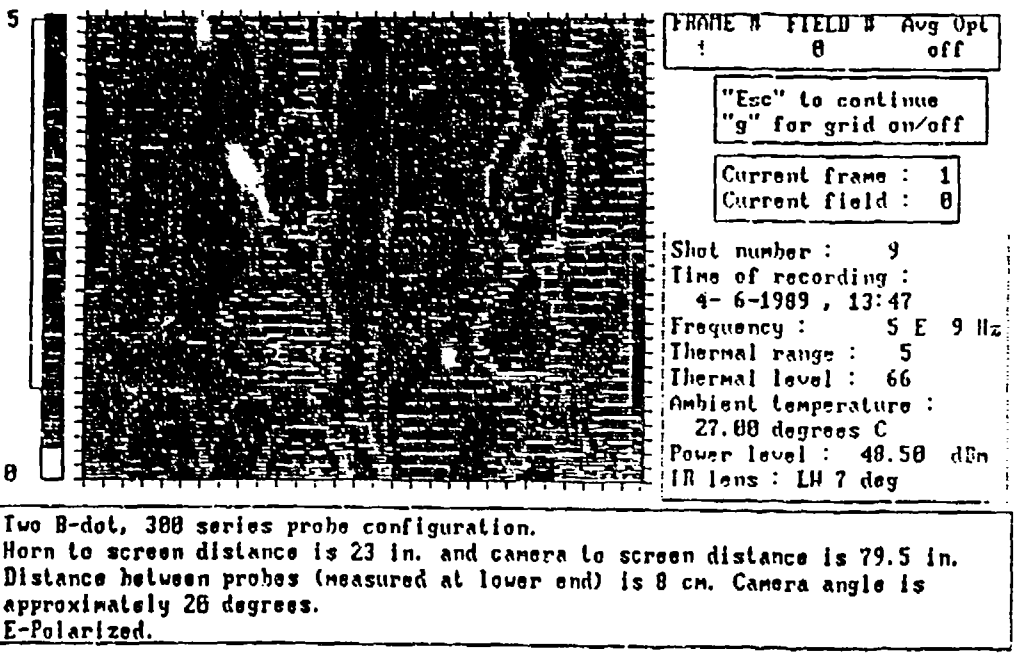
Power Level : 435 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P5GD8.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 8 cm. Camera angle is approximately 20 degrees.
E-Polarized.



Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 8 cm. Camera angle is approximately 20 degrees.
E-Polarized.

Figure X-6
Shot Number : 8

Time of Recording : 4- 6-1989 , 13:45

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 65

Ambient Temperature : 27.00°C

Power Level : 495 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P5G07.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 7 cm. Camera angle is
approximately 20 degrees.
E-Polarized.

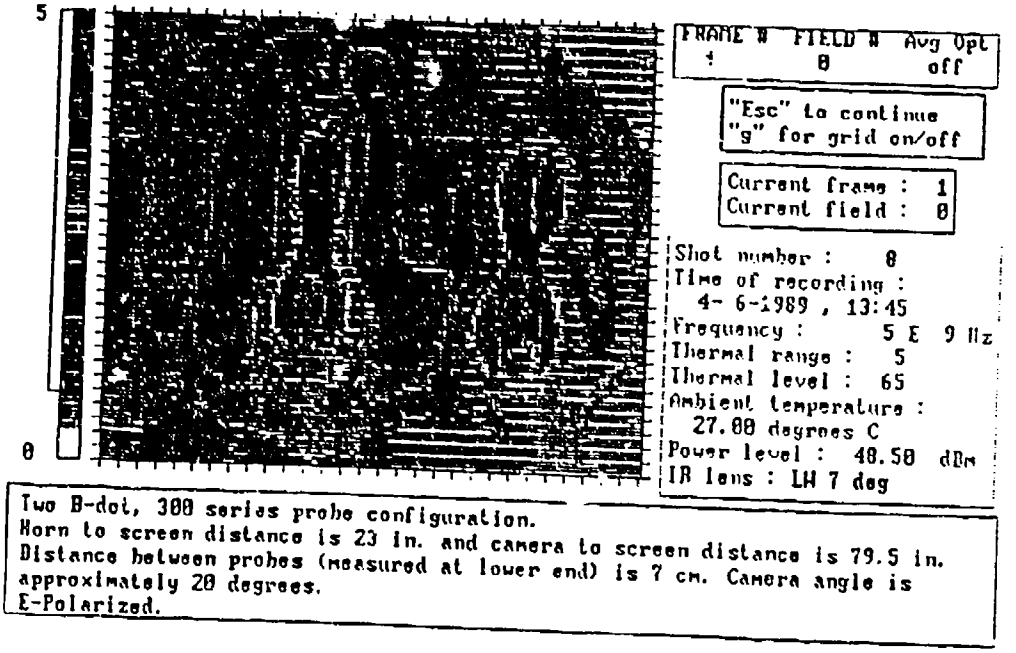


Figure K-7
Shot Number : 7

Time of Recording : 4- 6-1989 , 13:42

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 66

Ambient Temperature : 27.00°C

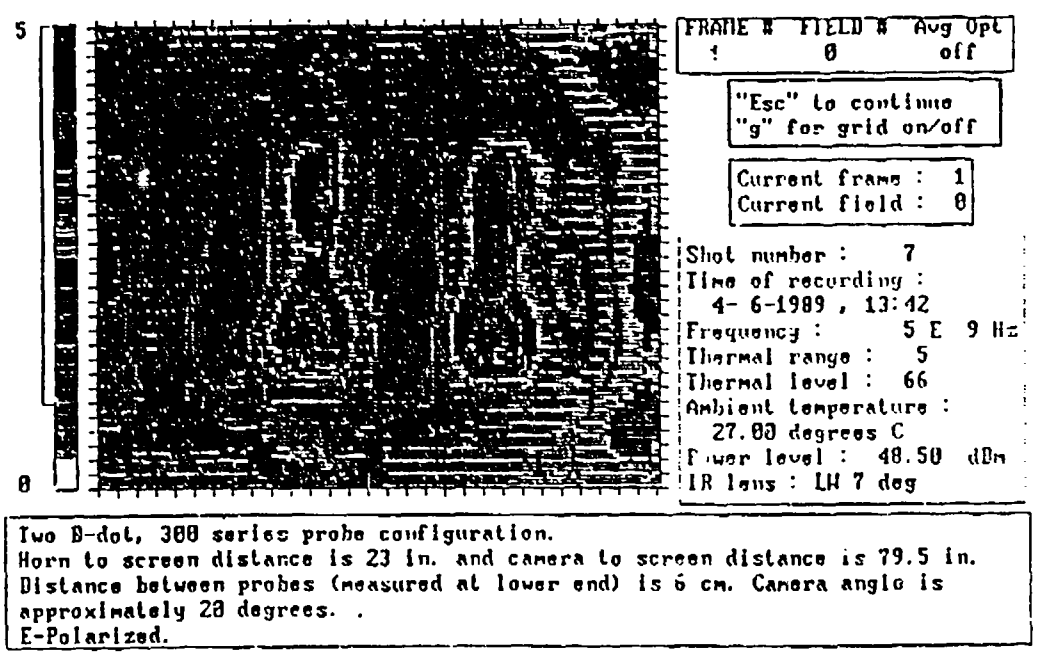
Power Level : 495 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P5G06.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 6 cm. Camera angle is
approximately 20 degrees.
E-Polarized.



Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 6 cm. Camera angle is
approximately 20 degrees. .
E-Polarized.

Figure K-8
Shot Number : 6

Time of Recording : 4- 6-1989 , 13:38

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 67

Ambient Temperature : 27.00°C

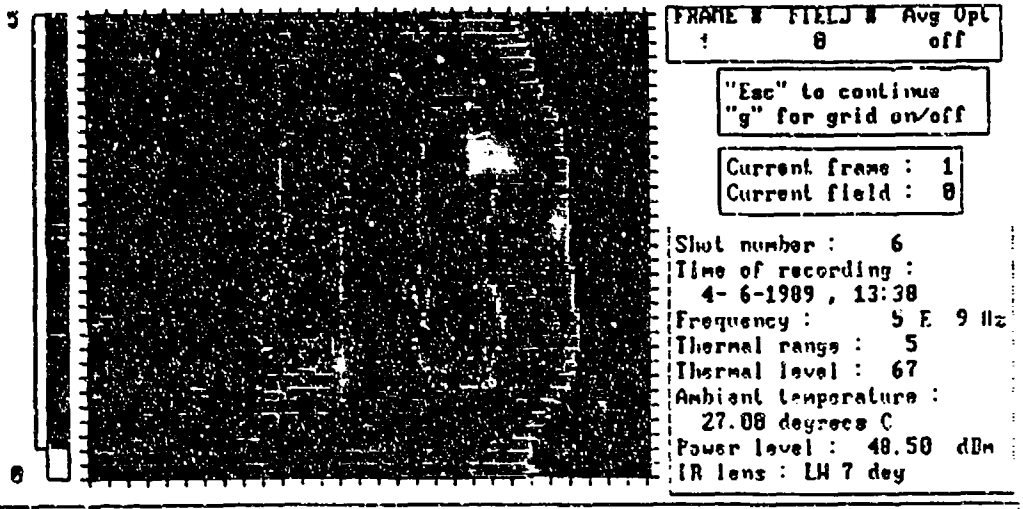
Power Level : 485 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P5G05.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 5 cm. Camera angle is approximately 20 degrees.
E-Polarized.



Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 5 cm. Camera angle is approximately 20 degrees.
E-Polarized.

Figure K-9

Shot Number : 5

Time of Recording : 4- 6-1989 , 13:35

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 66

Ambient Temperature : 27.00°C

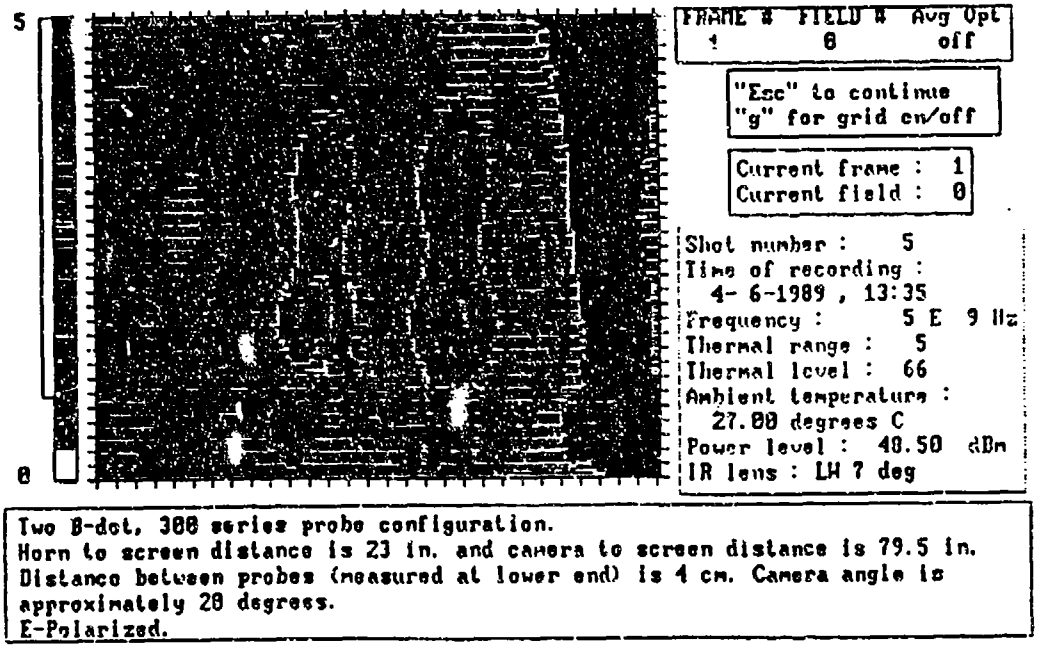
Power Level : 435 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P5GD4.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 4 cm. Camera angle is approximately 20 degrees.
E-Polarized.



Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 4 cm. Camera angle is approximately 20 degrees.
E-Polarized.

Figure K-10
Shot Number : 4

Time of Recording : 4- 6-1989 , 13:32

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 71

Ambient Temperature : 27.00°C

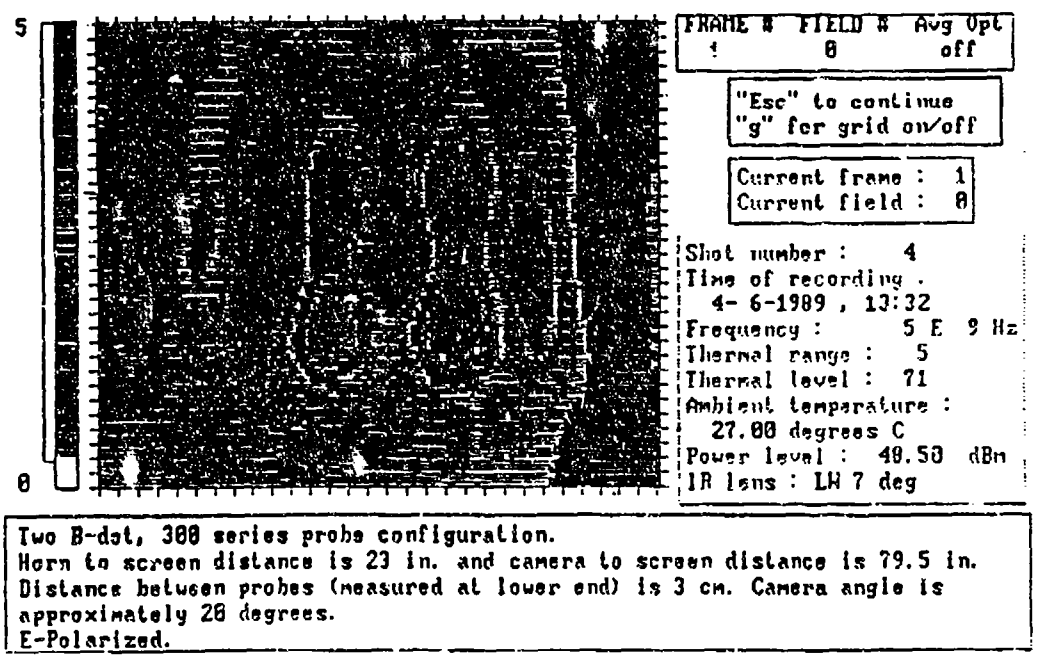
Power Level : 485 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P5GD3.RAW

Comments :

Two 8-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 3 cm. Camera angle is approximately 20 degrees.
E-Polarized.



Two 8-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 3 cm. Camera angle is approximately 20 degrees.
E-Polarized.

FIgure K-11

Shot Number : 2

Time of Recording : 4- 6-1989 , 13:26

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 73

Ambient Temperature : 27.00°C

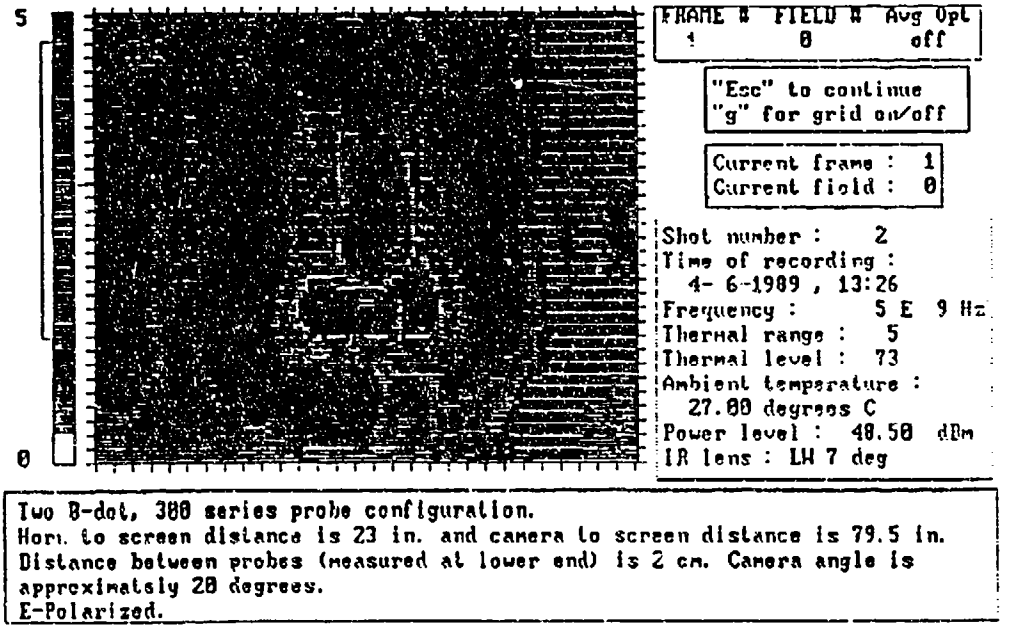
Power Level : 485 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P5GD2.RAW

Comments :

Two 8-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79. in
Distance between probes (measured at lower end) is 2 cm. Camera angle is
approximately 20 degrees.
E-Polarized.



Two 8-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 2 cm. Camera angle is
approximately 20 degrees.
E-Polarized.

FIgure K-12
Shot Number : 1

Time of Recording : 4- 6-1989 , 13:14

Frequency : 5 x 10^9 Hz

Thermal Range : 5

Thermal Level : 70

Ambient Temperature : 27.00°C

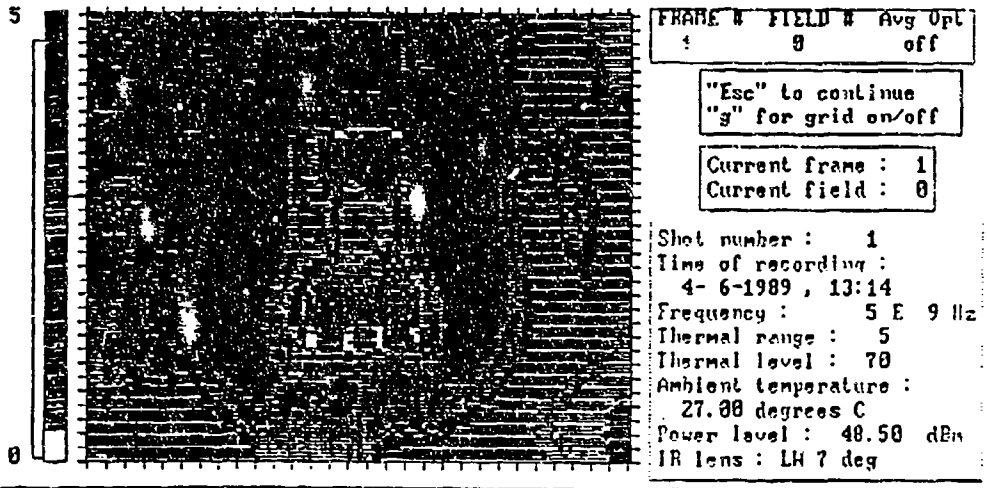
Power Level : 485 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

.Name of Stored Data File : P2PSGD1.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 1 cm. Camera angle is approximately 20 degrees.
E-Polarized.



Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 1 cm. Camera angle is approximately 20 degrees.
E-Polarized.

APPENDIX L

DATA: Two Probes

(10 GHz)

RADC PROBE STUDY
TWO-PROBES CONFIGURATION
DETAILED TOP VIEW OF SET UP

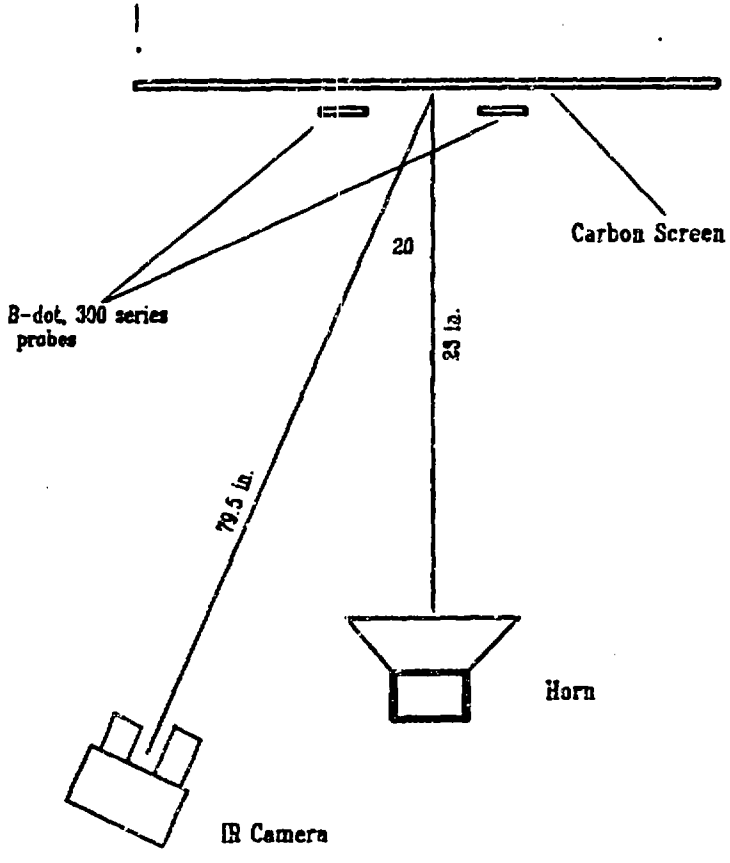


FIGURE 1

Figure L-2

RADC PROBE STUDY
TWO-PROBE CONFIGURATION
CAMERA VIEW

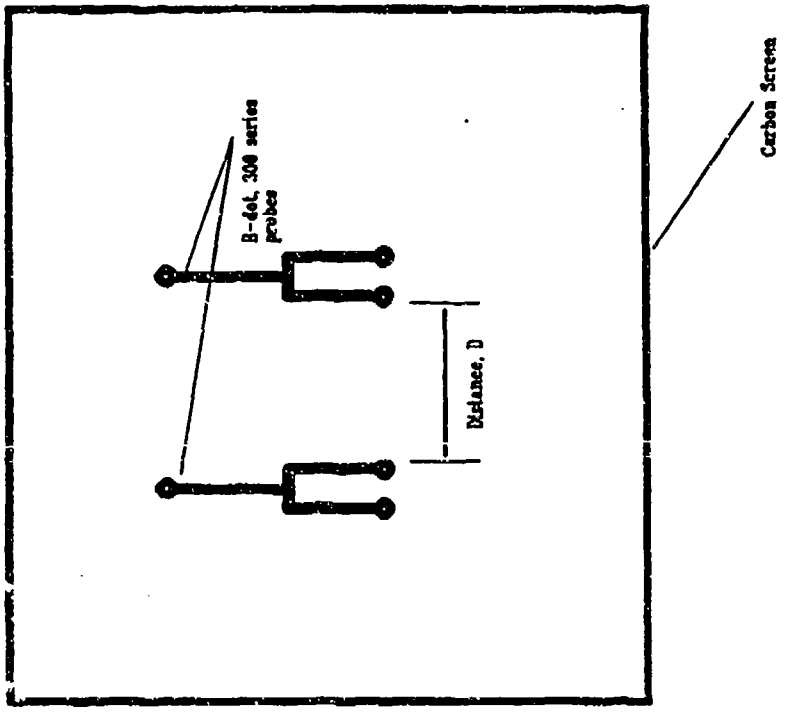


FIGURE 2

Figure L-3
Shot Number : 3018

Time of Recording : 2-13-1989 , 15:43

Frequency : 10 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 27.00°C

Power Level : 494 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P10GD10.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 10 cm. Camera angle is approximately 20 degrees.
E-polarized.

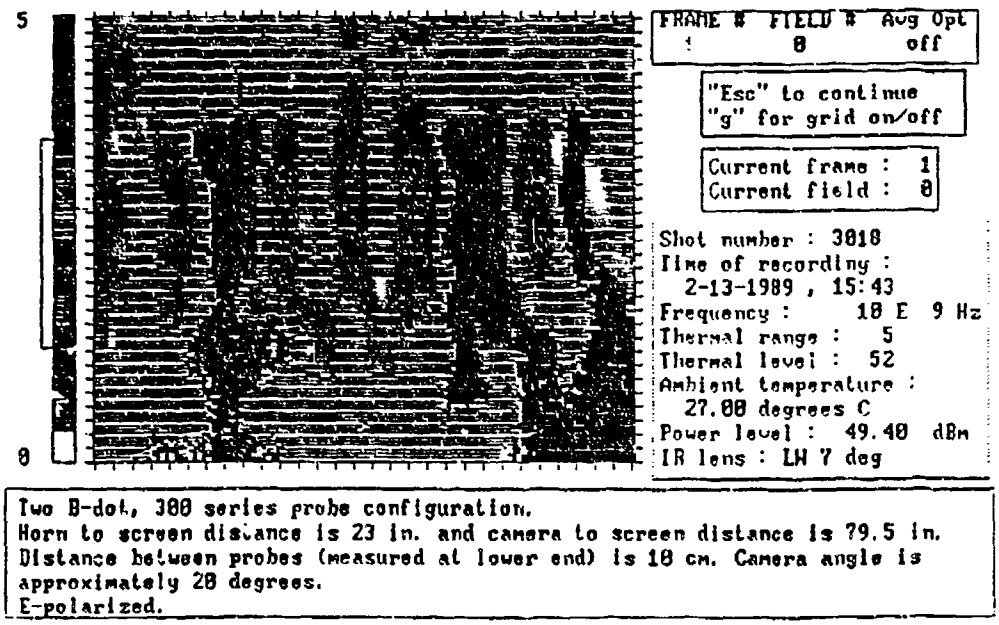


Figure L-4
Shot Number : 3017

Time of Recording : 2-13-1989 , 15:38

Frequency : 10 x 10^9 Hz

Thermal Range : 5

Thermal Level : 53

Ambient Temperature : 27.00°C

Power Level : 493 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P10GD9.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 9 cm. Camera angle is approximately 20 degrees.
E-polarized.

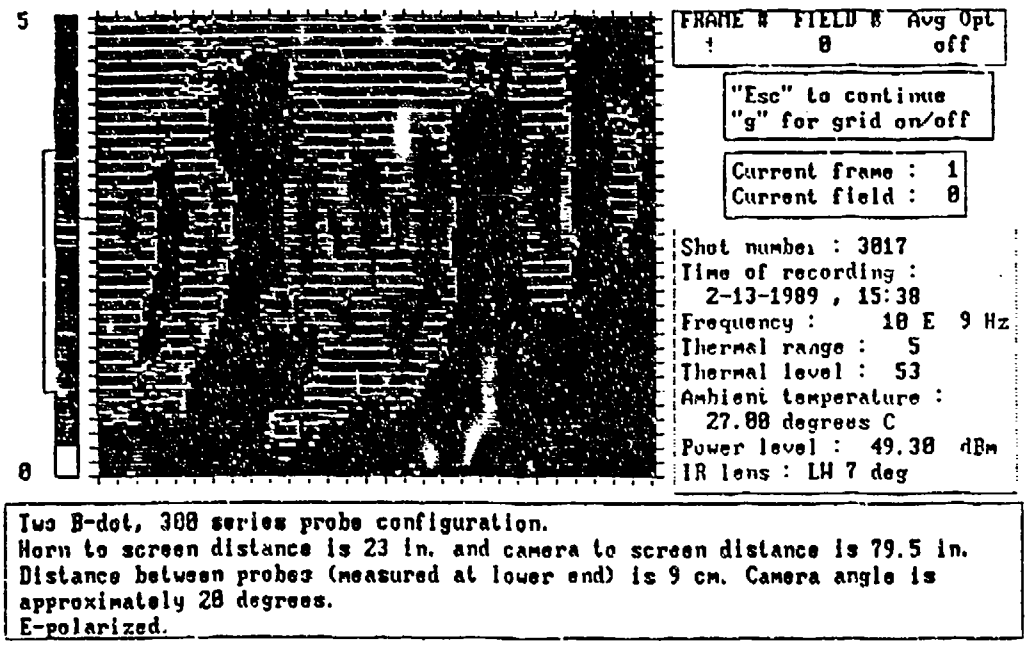


Figure L-5
Shot Number : 3015

Time of Recording : 2-13-1989 , 15:27

Frequency : 10 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 27.00°C

Power Level : 496 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P10GD7.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 7 cm. Camera angle is approximately 20 degrees.
E-polarized.

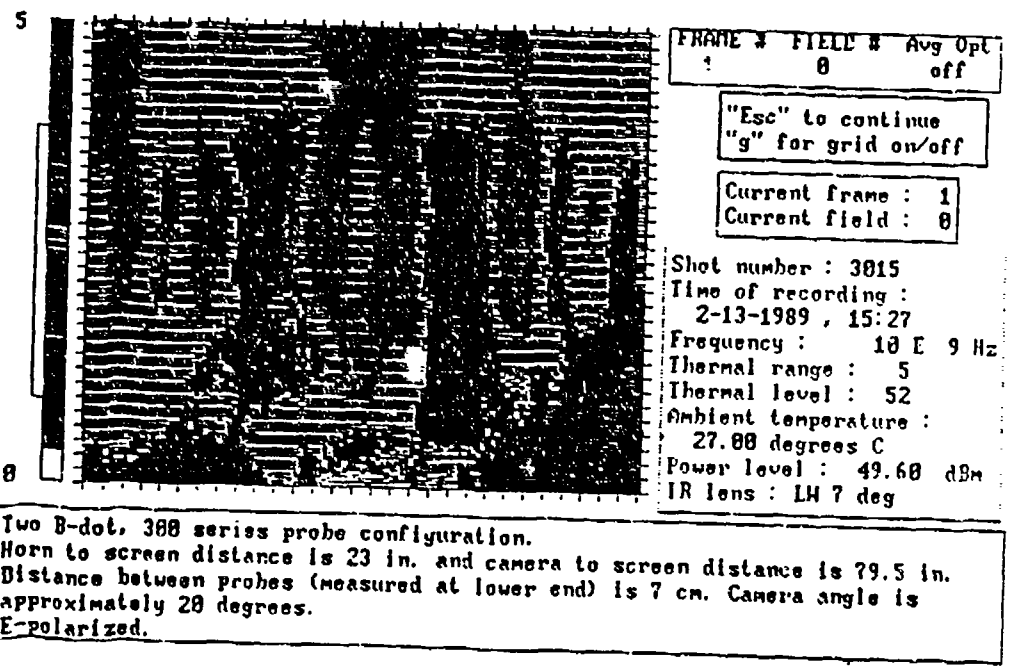


Figure L-6
Shot Number : 3012

Time of Recording : 2-13-1989 , 15:22

Frequency : 10 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 27.00°C

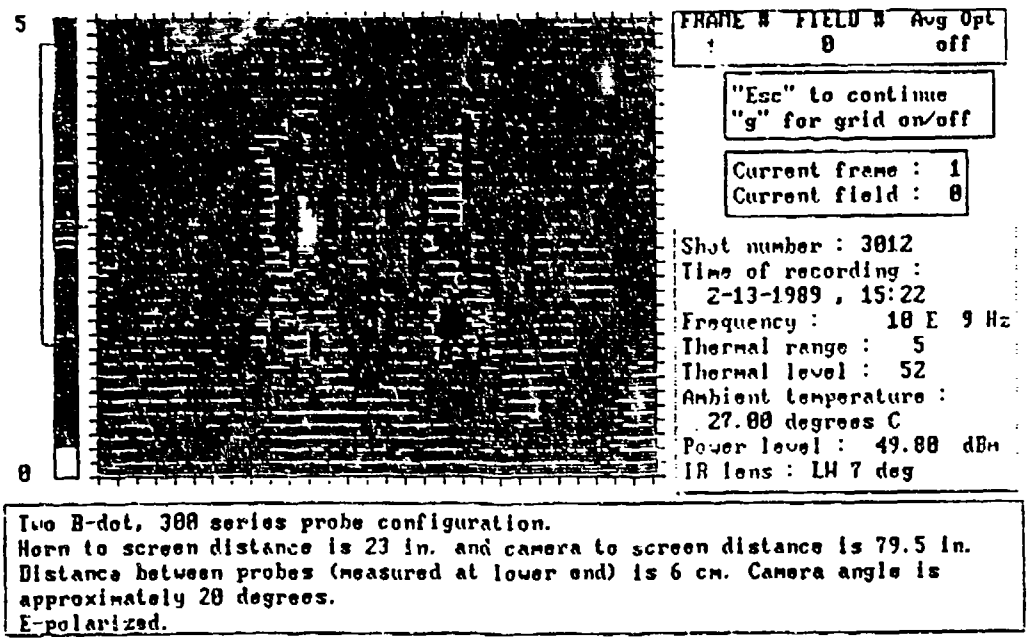
Power Level : 493 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P10G06.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 6 cm. Camera angle is approximately 20 degrees.
E-polarized.



Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 6 cm. Camera angle is approximately 20 degrees.
E-polarized.

Figure L-7

Shot Number : 3009

Time of Recording : 2-13-1989 , 15:16

Frequency : 10 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 27.00°C

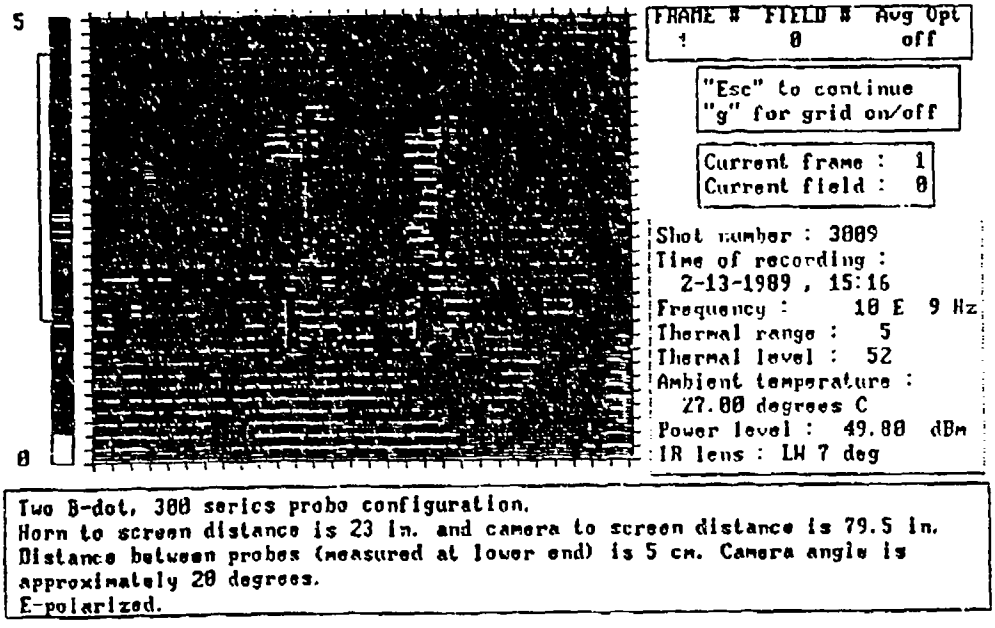
Power Level : 498 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : R2P10G05.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 5 cm. Camera angle is approximately 20 degrees.
E-polarized.



Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 5 cm. Camera angle is approximately 20 degrees.
E-polarized.

Figure L-8
Shot Number : 3008

Time of Recording : 2-13-1989 , 15:11

Frequency : 10 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 27.00°C

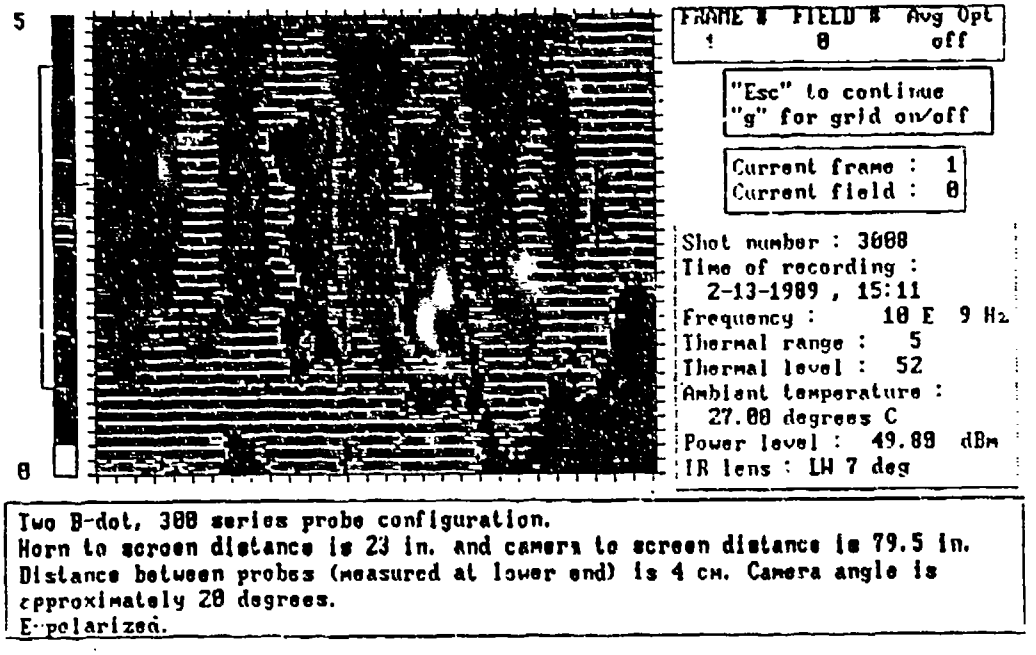
Power Level : 498 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r2p10gd4.raw

Comments :

Two 8-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 4 cm. Camera angle is approximately 20 degrees.
E-polarized.



Two 8-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 4 cm. Camera angle is approximately 20 degrees.
E-polarized.

Figure L-9
Shot Number : 3004

Time of Recording : 2-13-1989 , 14:58

Frequency : 10 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 27.00°C

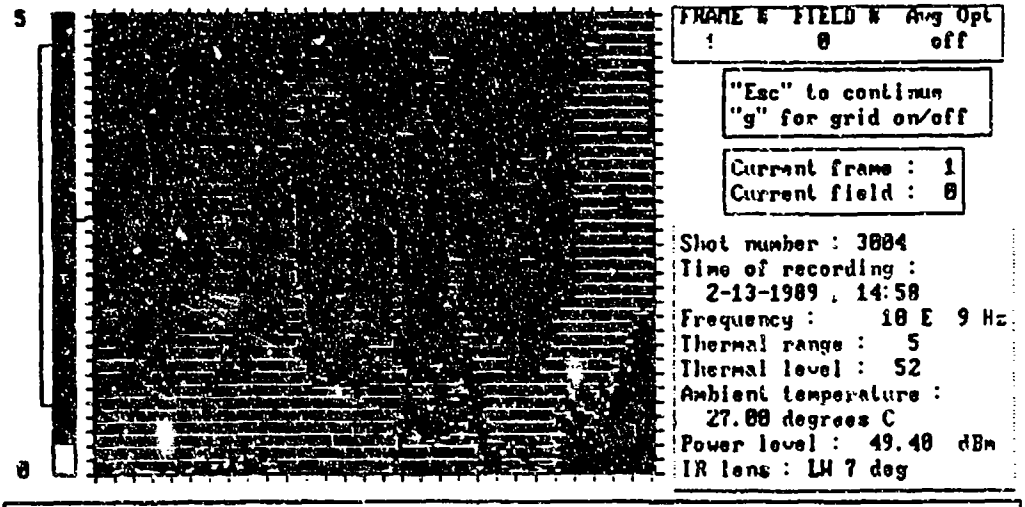
Power Level : 494 E -1

IR Camera Lens : Long Wave, f/1.8, 7°

Name of Stored Data File : r2p10gd3.raw

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 3 cm. Camera angle is approximately 20 degrees.
E-polarized.



Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 3 cm. Camera angle is approximately 20 degrees.
E-polarized.

Figure L-10
Shot Number : 3000

Time of Recording : 2-13-1989 , 13:12

Frequency : 10 x 10^9 Hz

Thermal Range : 5

Thermal Level : 51

Ambient Temperature : 27.00°C

Power Level : 50 E 0

IR Camera Lens : Long Wave, f/1.3, 7°

Name of Stored Data File : r2p10gd2.raw

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 2 cm. Camera angle is approximately 20 degrees.
E-polarized.

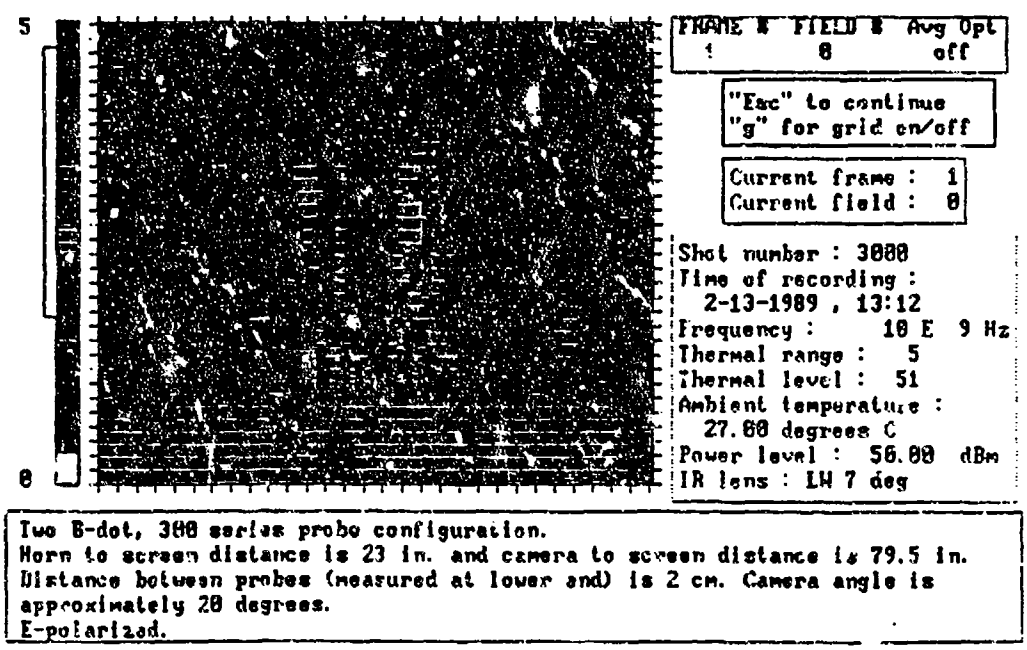


Figure E-11
Shot Number : 3010

Time of Recording : 2-13-1989 , 12:31

Frequency : 10 x 10^9 Hz

Thermal Range : 5

Thermal Level : 52

Ambient Temperature : 27.00°C

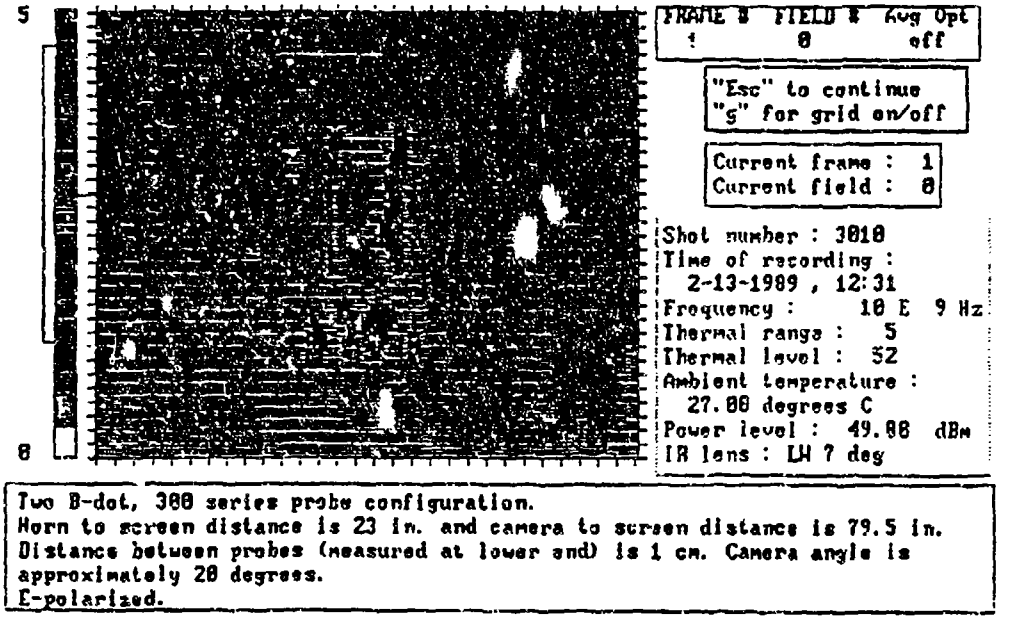
Power Level : 498 E -1

IR Camera Lens : Long Wave, f/1.8, 7"

Name of Stored Data File : R2P10GD1.RAW

Comments :

Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 1 cm. Camera angle is approximately 20 degrees.
E-polarized.



Two B-dot, 300 series probe configuration.
Horn to screen distance is 23 in. and camera to screen distance is 79.5 in.
Distance between probes (measured at lower end) is 1 cm. Camera angle is approximately 20 degrees.
E-polarized.